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<td>1.5</td>
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1 Introduction

This document specifies the Microsoft Office SharePoint Server (MOSS) Analytics View Access Protocol. This protocol enables a protocol client to retrieve analytical data about web-traffic, searches and inventory of various entities in the farm from a store on the protocol server.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Sections 1.5 and 1.9 are also normative but cannot contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are defined in [MS-GLOS]:

- Coordinated Universal Time (UTC)
- GUID

The following terms are defined in [MS-OFCGLOS]:

- best bet
- content type
- farm
- list template
- query text
- search scope
- site
- site collection
- site template
- table-valued function
- Uniform Resource Locator (URL)
- Web application

The following terms are specific to this document:

- MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

References to Microsoft Open Specifications documentation do not include a publishing year because links are to the latest version of the technical documents, which are updated frequently. References to other documents include a publishing year when one is available.

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.
1.2.2 Informative References

[MS-OFCGLOS] Microsoft Corporation, "Microsoft Office Master Glossary".

1.3 Protocol Overview (Synopsis)

This protocol enables a protocol client to retrieve analytical data from a store on the protocol server. There are three categories of analytical data that the protocol can retrieve. These three categories are:

- **Traffic data**: This data is about web-traffic. Examples are top visited web-pages and trends about web-page visits, top visitors and trends about number of unique visitors.

- **Search reports**: This data is about search queries and search results. Examples are top queries, failed queries and number of queries.

- **Inventory reports**: This data is about utilization of various entities such as storage, libraries and templates.

For example, the protocol enables a client to retrieve data about the traffic volume per day for a particular site, the top pages visited for that site and the top visitors for that particular site. If hierarchical relationships between the various entities are present in the store, then such analytical data can also be retrieved for various entities at various levels in the farm, such as site (2), site collection and Web application (1).

The protocol defines a set of **table-valued functions** that enable retrieving such data from the server.

1.4 Relationship to Other Protocols

This protocol communicates with the database server using T-SQL. The communication of T-SQL to TDS, TCP and IP is an industry standard.

The following diagram shows the transport stack for this protocol and its relationship to other protocols:
1.5 Prerequisites/Preconditions

The operations described by this protocol operate between a protocol client and a protocol server. The client is expected to have the location and connection information for the required databases on the protocol server.

This protocol requires that the protocol client has appropriate permissions to call the table-valued functions in the required databases on the protocol server.

1.6 Applicability Statement

This protocol is intended for use by protocol clients and protocol servers that are both connected by high-bandwidth, low latency network connections.

1.7 Versioning and Capability Negotiation

Security and Authentication Methods: This protocol supports the SSPI and SQL Authentication with the Protocol Server role specified in [MS-TDS].

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.
2 Messages

2.1 Transport

[MS-TDS] specifies the transport protocol used to call the table-valued functions.

2.2 Common Data Types

2.2.1 Simple Data Types and Enumerations

The following table lists the user-defined types specified in this protocol:

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Description</th>
<th>Equivalent Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>QueryStringDataType</td>
<td>This type is used to specify search query text.</td>
<td>nvarchar (1024)</td>
</tr>
<tr>
<td>AssetIdDataType</td>
<td>This type is used to specify a URL.</td>
<td>nvarchar (2083)</td>
</tr>
<tr>
<td>AssetTitleDataType</td>
<td>This type is used to specify a URL’s title.</td>
<td>nvarchar (255)</td>
</tr>
<tr>
<td>SiteInventoryDimensionDataType</td>
<td>This type is used to specify the name of a dimension. See section 2.2.5.4 for valid dimension names.</td>
<td>nvarchar (255)</td>
</tr>
<tr>
<td>UserDepartmentDataType</td>
<td>This type is used to specify the name of a user department.</td>
<td>nvarchar (400)</td>
</tr>
<tr>
<td>UserIdDataType</td>
<td>This type is used to specify a user name.</td>
<td>nvarchar (400)</td>
</tr>
<tr>
<td>OriginDataType</td>
<td>This type is used to specify the URL of a referrer, as described in section 2.2.5.21.</td>
<td>nvarchar (2083)</td>
</tr>
<tr>
<td>BrowserNameDataType</td>
<td>This type is used to specify the name of a browser.</td>
<td>nvarchar (128)</td>
</tr>
</tbody>
</table>

2.2.2 Bit Fields and Flag Structures

No common bit field or flag structures are defined in this protocol.

2.2.3 Binary Structures

No common binary structures are defined in this protocol.

2.2.4 Result Sets

No result sets are defined in this protocol.
2.2.5 Tables and Views

The following are the table-valued functions defined by this protocol.

2.2.5.1 fn_WA_GetBestBetSuggestions

This table-valued function MUST return a table that represents all the queries and URL best bets recommended by the protocol for the specified entity.

CREATE FUNCTION fn_WA_GetBestBetSuggestions(@AggregationId)

```
    QueryText QueryStringDataType NOT NULL,
    PageId AssetIdDataType NOT NULL,
    PageTitle AssetTitleDataType NULL,
    Status varchar(10) NULL,
    CreationDateTime datetime NOT NULL,
    ActionDateTime dateTime NULL,
```

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

QueryText: The query text associated with a best bet recommendation.

PageId: The URL that is a recommended best bet for QueryText.

PageTitle: The title of the page that’s associated with the URL.

Status: The last action taken for this best bet recommendation. If action is taken it MUST be one of the strings "Accepted" or "Rejected". If no action is taken then it can be NULL.

CreationDateTime: The date and time when the best bet was created. MUST be in UTC.

ActionDateTime: The date and time when the action represented by Status was taken. MUST be in UTC.

2.2.5.2 fn_WA_GetBestBetUsage

This table-valued function MUST return a table that represents best bet queries, query frequency, best bet URL, the URL’s click frequency and percentage of clicks of the best bet URL versus overall clicks for the specified entity.

CREATE FUNCTION fn_WA_GetBestBetUsage(@StartDateId, @EndId, @AggregationId)

```
    QueryText QueryStringDataType NOT NULL,
    PageId AssetIdDataType NOT NULL,
    PageTitle AssetTitleDataType NULL,
    QueryFrequency bigint NOT NULL,
    ClickFrequency bigint NOT NULL,
    ClickPercentage real NULL,
    Status varchar(10) NULL,
    ActionDateTime dateTime NULL,
```

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:
value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

QueryText: The query text associated with a best bet recommendation.

PageId: The URL that is a recommended best bet for QueryText.

PageTitle: The title of the page that's associated with the URL.

QueryFrequency: The number of times the QueryText was issued for the AggregationId in the given date range specified by StartDateId and EndDateId.

ClickFrequency: The number of times the PageId was clicked when the QueryText was issued for the AggregationId in the given date range specified by StartDateId and EndDateId.

ClickPercentage: The percentage of clicks of the PageId vs. other URLs clicked from the search results for the given QueryText.

Status: The last action taken for this best bet recommendation. MUST be one of the strings "Accepted" or "Rejected".

ActionDateTime: The date and time when the action represented by Status was taken. MUST be in UTC.

2.2.5.3 fn_WA_GetClickthroughChanges

This table-valued function MUST return a table that represents the pages that were most visited along with their previous rank, current frequency and previous frequency for the specified entity.

CREATE FUNCTION fn_WA_GetClickthroughChanges(@CurrentStartDateId, @PreviousStartDateId, @Duration, @AggregationId, @IncludeSubSites, @ContentType, @UserTitle, @UserDepartment)

PageId AssetIdDataType NULL,
PageTitle AssetTitleDataType NULL,
CurrentFrequency bigint NOT NULL,
PreviousFrequency bigint NOT NULL,
PreviousRank bigint NULL,

@CurrentStartDateId: The start date of the current date range. The type of CurrentStartDateId MUST be an integer. The value MUST be calculated as the following:
value = (((year * 100) + month) * 100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@PreviousStartDateId: The start date of the previous date range. The type of PreviousStartDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year * 100) + month) * 100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@Duration: The duration of the current date range and previous date range in number of days. The type of Duration MUST be an integer.

@AggregationId: Identifier of entity for which data is being requested. The MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When its 1 it means data includes the entity and the entire hierarchy under the entity and 0 means it includes data for the entity only.

@ContentType: A string value that specifies that the data MUST be scoped to the specified content type. MUST be NULL when EventType = "Search"

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

PageId: The URL of the visited page.

PageTitle: The title of the visited page.

CurrentFrequency: The number of times the PageId was visited in the current date range.

PreviousFrequency: The number of times the PageId was visited in the past date range.

PreviousRank: The previous rank of PageId where rank specifies the position of PageId in a descending ordered list of most visited PageIds.

2.2.5.4 fn_WA_GetInventory

This table-valued function MUST return a table that represents the site templates, product versions, languages and list templates present in the specified entity.

CREATE FUNCTION fn_WA_GetInventory(@AggregationId, @IncludeSubSites, @MetricType, @DimensionType)

    DimensionName SiteInventoryDimensionDataType NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,
@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@MetricType: An integer value that specifies the type of metric being requested. The value MUST be one of the following:

- **MetricType = 1**: Data is being requested for a site (2).
- **MetricType = 2**: Data is being requested for a site collection.
- **MetricType = 5**: Data is being requested for maximum storage.

@DimensionType: An integer value that specifies the type of inventory being requested. The value MUST be one of the following:

- **DimensionType = 0**: Data is being requested for templates.
- **DimensionType = 1**: Data is being requested for product versions.
- **DimensionType = 2**: Data is being requested for languages.

**DimensionName**: The name of the dimension. The value MUST be a name of a template, the value of a product version or the name of a language, depending on the requested DimensionType.

**Frequency**: The number of sites (2) as specified by MetricType, of the dimension present in the entity.

**Percentage**: The percentage of the dimension specified by DimensionName compared to all dimensions.

### 2.2.5.5 fn_WA_GetInventoryPerDay

This table-valued function MUST return a table that represents the number of sites (2), site collections and storage size per day present in the specified entity.

```sql
CREATE FUNCTION fn_WA_GetInventoryPerDay(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

  DateId int NOT NULL,
  Sites int NOT NULL,
  Webs bigint NOT NULL,
  StorageSize bigint NOT NULL,
  MaxStorage bigint NOT NULL,
```

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

```sql
value = (((year*100) + month)*100 + day)
```
where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@endDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[
    \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@DateId: An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

\[
    \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

Sites: The number of site collections present in the entity on the DateId.

Webs: The number of sites (2) present in the entity on the DateId.

StorageSize: The storage size of the entity on the DateId.

MaxStorage: The maximum storage size of the entity on the DateId.

**2.2.5.6 fn_WA_GetLast24HourClickthroughChanges**

This table-valued function MUST return a table that represents the pages that were most visited in the last 24 hours along with their previous rank, current frequency and previous frequency for the specified entity.

CREATE FUNCTION fn_WA_GetLast24HourClickthroughChanges(@AggregationId, @IncludeSubSites, @ContentType, @UserTitle, @UserDepartment)

    PageId AssetIdDataType NULL,
    PageTitle int NULL,
    CurrentFrequency bigint NOT NULL,
    PreviousFrequency bigint NOT NULL,
    PreviousRank bigint NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.
@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ContentType: A string value that specifies that the data MUST be scoped to the specified content type. MUST be NULL when EventType = "Search"

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

PageId: The URL of the visited page.

PageTitle: The title of the visited page.

CurrentFrequency: The number of times the PageId was visited in the last 24 hours.

PreviousFrequency: The number of times the PageId was visited in the 24 hours prior to the last 24 hours.

PreviousRank: The previous rank of PageId where rank specifies the position of PageId in a descending ordered list of most visited PageIds.

2.2.5.7 fn_WA_GetLast24HourSearchQueryChanges

This table-valued function MUST return a table that represents the search queries most issued in the last 24 hours along with their previous rank, current frequency and previous frequency for the specified entity.

CREATE FUNCTION fn_WA_GetLast24HourSearchQueryChanges(@AggregationId,
@includeSubSites, @ScopeName, @UserTitle, @UserDepartment)

QueryText QueryStringDataType NULL,
CurrentFrequency bigint NOT NULL,
PreviousFrequency bigint NOT NULL,
PreviousRank bigint NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@includeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text.

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

QueryText: The query text associated with the search query.
CurrentFrequency: The number of times the QueryText was issued in the last 24 hours.

PreviousFrequency: The number of times the QueryText was issued in the 24 hours prior to the last 24 hours.

PreviousRank: The previous rank of the QueryText where rank specifies the position of the QueryText in a descending ordered list of most issued queries.

2.2.5.8 fn_WA_GetLast24HourUserDepartments

This table-valued function MUST return a table that represents the user departments of the users with page view or search events in the last 24 hours for the specified entity.

CREATE FUNCTION fn_WA_GetLast24HourUserDepartments(@AggregationId, @IncludeSubSites)

    UserDepartment UserDepartmentDataType NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

UserDepartment: A string value that specifies the user department.

2.2.5.9 fn_WA_GetLast24HourUserTitles

This table-valued function MUST return a table that represents the user titles of the users with page view or search events in the last 24 hours for the specified entity.

CREATE FUNCTION fn_WA_GetLast24HourUserTitles(@AggregationId, @IncludeSubSites)

    UserTitle UserTitleDataType NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

UserTitle: A string value that specifies the user title.

2.2.5.10 fn_WA_GetNumberOfClickthroughs

This table-valued function MUST return a table that represents the number of page views for the specified entity grouped per day or grouped by URL.

CREATE FUNCTION fn_WA_GetNumberOfClickthroughs(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @ContentType, @UserTitle, @UserDepartment, @GroupByDate, @GroupByPageId)
DateId int NULL,
PageId AssetIdDataType NULL,
PageTitle AssetTitleDataType NULL,
Frequency bigint NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ContentType: A string value that specifies that the data MUST be scoped to the specified content type. MUST be NULL when EventType = "Search".

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

@GroupByDate: A boolean value that specifies if the data is to be grouped by date. MUST be either 0 or 1. If both GroupByDate and GroupByPageId are set to 1, each row is the total frequency of the page per DateId per PageId.

@GroupByPageId: A boolean value that specifies if the data is to be grouped by PageId. MUST be either 0 or 1. If both GroupByDate and GroupByPageId is set to 1 each row is the total frequency of the page per DateId per PageId.

DateId: An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively. If GroupByDate is 0, DateId MUST be NULL.
PageId: The URL of the visited page. If GroupByPageId is 0, PageId MUST be NULL.

PageTitle: The title of the visited page. If GroupByPageId is 0, PageTitle MUST be NULL.

Frequency: The number of page views in the given date range specified by StartDateId and EndDateId. If GroupByDate is 1, Frequency MUST be grouped by DateId. If GroupByPageId is 1, Frequency must be grouped by PageId.

2.2.5.11 fn_WA_GetNumberOfFailedSearchQueriesPerDay

This table-valued function MUST return a table that represents the number of search queries per day for the specified entity that didn’t give satisfactory results.

CREATE FUNCTION fn_WA_GetNumberOfFailedSearchQueriesPerDay(
@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

DateId int NOT NULL,
TotalFrequency bigint NOT NULL,
AbandonedFrequency bigint NOT NULL,
ZeroResultFrequency bigint NOT NULL,
AbandonedPercentage real NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

DateId: An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.
**TotalFrequency**: The total number of search queries issued on **DateId**.

**AbandonedFrequency**: The number of search queries for which the user did not click any search results on **DateId**.

**ZeroResultFrequency**: The number of search queries which did not return any search results on **DateId**.

**AbandonedPercentage**: The ratio of **AbandonedFrequency** to **TotalFrequency** expressed as a percentage.

\[
\text{AbandonedPercentage} = \left( \frac{\text{AbandonedFrequency}}{\text{TotalFrequency}} \right) \times 100
\]

### 2.2.5.12 fn_WA_GetNumberOfSearchQueries

This table-valued function MUST return a table that represents the number of search queries for the specified entity grouped per day or grouped by query text.

```sql
CREATE FUNCTION fn_WA_GetNumberOfSearchQueries(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @ScopeName, @UserTitle, @UserDepartment, @GroupByDate, @GroupByQueryText)

DateId int NULL,
QueryText QueryStringDataType NULL,
Frequency bigint NOT NULL,

@StartDateId: The start date of the data being requested. The type of **StartDateId** MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of **EndDateId** MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of **AggregationId** MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by **AggregationId**. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text.
@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

@GroupByDate: A boolean value that specifies if the data is to be grouped by date. MUST be either 0 or 1. If both GroupByDate and GroupByQueryText are set to 1, each row is the total frequency of the page per DateId per QueryText.

@GroupByQueryText: A Boolean value that specifies if the data is to be grouped by QueryText. MUST be either 0 or 1. If both GroupByDate and GroupByQueryText is set to 1 each row is the total frequency of the page per DateId per QueryText.

DateId: An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively. If GroupByDate is 0, DateId MUST be NULL.

QueryText: The query text associated with the search. If GroupByQueryText is 0, QueryText MUST be NULL.

Frequency: The number of search queries issued in the given date range specified by StartDateId and EndDateId. If GroupByDate is 1, Frequency MUST be grouped by DateId. If GroupByQueryText is 1, Frequency MUST be grouped by QueryText.

2.2.5.13 fn_WA_GetNumberOfSearchQueriesPerDay

This table-valued function MUST return a table that represents the number of search queries per day for the specified entity within the specified date range.

CREATE FUNCTION fn_WA_GetNumberOfSearchQueriesPerDay (@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @ScopeName)

    DateId int NOT NULL,
    Frequency bigint NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]
where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text.

DateId: An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

\[
value = (((year \times 100) + month) \times 100 + day)
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

Frequency: The total number of search queries issued on DateId.

2.2.5.14 fn_WA_GetNumberOfSearchQueriesPerQueryTextHash

CREATE FUNCTION fn_WA_GetNumberOfSearchQueriesPerQueryTextHash(@StartDateId, @Duration, @AggregationId, @IncludeSubSites, @ScopeName, @UserTitle, @UserDepartment)

QueryTextHash StringHashIdDataType NOT NULL,
Frequency bigint NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
value = (((year \times 100) + month) \times 100 + day)
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@Duration: The duration of the current date range and previous date range in number of days. The type of value MUST be an integer.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text. MUST be NULL when EventType = "PageView"
@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

QueryTextHash: An MD5 Hash of the query text that was issued.

Frequency: The number of times the query text was issued.

2.2.5.15  fn_WA_GetSearchQueryChanges

This table-valued function MUST return a table that represents the search queries most issued along with their previous rank, current frequency and previous frequency for the specified entity.

CREATE FUNCTION fn_WA_GetSearchQueryChanges(@CurrentStartDateId, @PreviousStartDateId, @Duration, @AggregationId, @IncludeSubSites, @ScopeName, @UserTitle, @UserDepartment)

QueryText QueryStringDataType NOT NULL,
CurrentFrequency bigint NOT NULL,
PreviousFrequency bigint NOT NULL,
FrequencyChanges bigint NULL,
PreviousRank bigint NULL,

@CurrentStartDateId: The start date of the current date range. The type of CurrentStartDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@PreviousStartDateId: The start date of the previous date range. The type of PreviousStartDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@Duration: The duration of the current date range and previous date range in number of days. The type of value MUST be an integer.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text.

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.
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@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

QueryText: The query text associated with the search query.

CurrentFrequency: The number of times the QueryText was issued in the current date range.

PreviousFrequency: The number of times the QueryText was issued in the previous date range.

FrequencyChanges: Change in frequency value from previous date range to current date range.

PreviousRank: The previous rank of the QueryText where rank specifies the position of the QueryText in a descending ordered list of most issued queries.

2.2.5.16 fn_WA_GetSummary

This table-valued function MUST return a table that summarizes Traffic, Search and Inventory data for the specified entity.

CREATE FUNCTION fn_WA_GetSummary(@CurrentStartDateId, @PreviousStartDateId, @Duration,
                                    @AggregationId, @IncludeSubSites)

    PropertyName varchar(60) NOT NULL,
    CurrentValue bigint NULL,
    PreviousValue bigint NULL,
    PercentageChange real NULL,

@CurrentStartDateId: The start date of the current date range. The type of CurrentStartDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@PreviousStartDateId: The start date of the previous date range. The type of PreviousStartDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@Duration: The duration of the current date range and previous date range in number of days. The type of Duration MUST be an integer.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.
**PropertyName:** A string value that MUST be one of the following:

<table>
<thead>
<tr>
<th>PropertyName</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>PageViews</td>
<td>Number of page views</td>
</tr>
<tr>
<td>UniqueVisitors</td>
<td>Number of unique visitors</td>
</tr>
<tr>
<td>Referrers</td>
<td>Number of referrers</td>
</tr>
<tr>
<td>Searches</td>
<td>Number of search queries</td>
</tr>
<tr>
<td>Sites</td>
<td>Number of site collections</td>
</tr>
<tr>
<td>Webs</td>
<td>Number of sites (2)</td>
</tr>
<tr>
<td>StorageSize</td>
<td>Storage size in bytes</td>
</tr>
</tbody>
</table>
| InventoryDateId | Date when inventory was taken for Sites, Webs and StorageSize. Date MUST be in integer format, and MUST have been calculated as the following:  
\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

**CurrentValue:** Value of the PropertyName for the current date range.

**PreviousValue:** Value of the PropertyName for the prior date range.

**PercentageChange:** Change in value from previous date range to current date range, expressed as a percentage.

### 2.2.5.17 fn_WA_GetTopBrowsers

This table-valued function MUST return a table that represents the web browsers most used to browse the specified entity within the specified date range.

CREATE FUNCTION fn_WA_GetTopBrowsers(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

    BrowserName BrowserNameDataType NOT NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]
where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

BrowserName: The name of the web browser.

Frequency: The number of times BrowserName was used in the specified date range.

Percentage: Ratio of Frequency to sum of frequencies for all web browsers used in the specified date range, expressed as a percentage.

2.2.5.18 fn_WA_GetTopDestinations

This table-valued function MUST return a table that represents the most referred URLs that are outside the specified entity and are referred by the specified entity.

CREATE FUNCTION fn_WA_GetTopDestinations(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.
**PageId**: The URL of the referred page.

**Frequency**: The number of times PageId was referred by AggregationId in the specified date range.

**Percentage**: The ratio of Frequency to sum of frequencies of all referrals from the specified AggregationId in the specified date range, expressed as a percentage.

### 2.2.5.19 fn_WA_GetTopFailedSearchQueries

This table-valued function MUST return a table that represents the most issued search queries for the specified entity in the specified date range that didn’t give satisfactory results.

```sql
CREATE FUNCTION fn_WA_GetTopFailedSearchQueries(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @ScopeName)

    QueryText QueryStringDataType NULL,
    TotalFrequency bigint NOT NULL,
    AbandonedFrequency bigint NOT NULL,
    ZeroResultFrequency bigint NOT NULL,
    AbandonedPercentage real NULL,
    ZeroResultPercentage real NULL,
```

**@StartDateId**: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**@EndDateId**: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**@AggregationId**: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

**@IncludeSubSites**: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1.

**@ScopeName**: A string value that specifies the name of the search scope specified for the query text.

**QueryText**: The query text associated with the search query.

**TotalFrequency**: The number of times QueryText was issued in the specified date range.

**AbandonedFrequency**: The number of times QueryText was issued in the specified date range and the user did not click any search results.
**ZeroResultFrequency:** The number of times **QueryText** was issued in the specified date range and the query did not return any search results.

**AbandonedPercentage:** The ratio of AbandonedFrequency to TotalFrequency expressed as a percentage.

\[
\text{AbandonedPercentage} = \left(\frac{\text{AbandonedFrequency}}{\text{TotalFrequency}}\right) \times 100
\]

**ZeroResultPercentage:** The ratio of ZeroResultFrequency to TotalFrequency expressed as a percentage.

\[
\text{AbandonedPercentage} = \left(\frac{\text{ZeroResultFrequency}}{\text{TotalFrequency}}\right) \times 100
\]

### 2.2.5.20 fn_WA_GetTopPages

This table-valued function MUST return a table that represents the pages that were most visited for the specified entity in the specified date range.

```sql
CREATE FUNCTION fn_WA_GetTopPages(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

    PageId AssetIdDataType NULL,
    PageTitle AssetTitleDataType NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,
```

**@StartDateId:** The start date of the data being requested. The type of **StartDateId** MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year}\times100) + \text{month})\times100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**@EndDateId:** The end date of the data being requested. The type of **EndDateId** MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = (((\text{year}\times100) + \text{month})\times100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**@AggregationId:** Identifier of entity for which data is being requested. The type of **AggregationId** MUST be GUID.

**@IncludeSubSites:** A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by **AggregationId**. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

**PageId:** The URL of the visited page.

**PageTitle:** The title of the visited page.
Frequency: The number of times PageId was visited in the specified date range.

Percentage: The ratio of Frequency to sum of frequencies for all PageId visits in the specified date range, expressed as a percentage.

2.2.5.21  fn_WA_GetTopReferrers

This table-valued function MUST return a table that represents the URLs that are outside the specified entity and most referred the specified entity.

CREATE FUNCTION fn_WA_GetTopReferrers(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

    ReferrerId OriginDataType NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

ReferrerId: The URL of the referring page.

Frequency: The number of times ReferrerId referred AggregationId in the specified date range.

Percentage: The ratio of Frequency to sum of frequencies of all referrals to the specified AggregationId in the specified date range, expressed as a percentage.

2.2.5.22  fn_WA_GetTopSearchQueries

This table-valued function MUST return a table that represents the search queries most issued for the specified entity in the specified date range.
CREATE FUNCTION fn_WA_GetTopSearchQueries(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @ScopeName)

    QueryText QueryStringDataType NOT NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year * 100) + month) * 100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

    value = (((year * 100) + month) * 100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text.

QueryText: The query text associated with the query.

Frequency: The number of times QueryText was issued in the specified date range.

Percentage: The ratio of Frequency to sum of frequencies for all search queries in the specified date range, expressed as a percentage.

2.2.5.23 fn_WA_GetTopVisitors

This table-valued function MUST return a table that represents the visitors who most visited the specified entity in the specified date range.

CREATE FUNCTION fn_WA_GetTopVisitors(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

    UserName UserIdDataType NOT NULL,
    Frequency bigint NOT NULL,
    Percentage real NULL,
@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = ((\text{year}\times100 + \text{month})\times100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = ((\text{year}\times100 + \text{month})\times100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

UserName: A string value that specifies the user name.

Frequency: The number of times UserName visited AggregationId in the specified date range.

Percentage: The ratio of Frequency to sum of frequencies for all visits to AggregationId in the specified date range, expressed as a percentage.

2.2.5.24 fn_WA_GetTotalTrafficVolume

This table-valued function MUST return a table that represents the number of page views, unique visitors, referrers, destinations or search queries as specified by MetricType for the specified entity within the specified date range.

CREATE FUNCTION fn_WA_GetTotalTrafficVolume(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @MetricType)

 Frequency bigint NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[
\text{value} = ((\text{year}\times100 + \text{month})\times100 + \text{day})
\]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:
where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@MetricType: An integer value that MUST be one of the following:

<table>
<thead>
<tr>
<th>MetricType</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of page views</td>
</tr>
<tr>
<td>2</td>
<td>Number of unique visitors</td>
</tr>
<tr>
<td>3</td>
<td>Number of URLs that referred this entity</td>
</tr>
<tr>
<td>4</td>
<td>Number of URLs that were referred by this entity</td>
</tr>
<tr>
<td>5</td>
<td>Number of search queries</td>
</tr>
</tbody>
</table>

Frequency: Value of MetricType for the specified date range.

2.2.5.25 fn_WA_GetTrafficVolumePerDay

This table-valued function MUST return a table that represents the number of page views, unique visitors, referrers, destinations or search queries as specified by MetricType for the specified entity grouped per day within the specified date range.

CREATE FUNCTION fn_WA_GetTrafficVolumePerDay(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites, @MetricType)

    DateId int NOT NULL,
    Frequency bigint NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

value = (((year*100) + month)*100 + day)
where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**@AggregationId:** Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

**@IncludeSubSites:** A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it includes data for the entity only.

**@MetricType:** An integer value that MUST be one of the following:

<table>
<thead>
<tr>
<th>MetricType</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of page views</td>
</tr>
<tr>
<td>2</td>
<td>Number of unique visitors</td>
</tr>
<tr>
<td>3</td>
<td>Number of URLs that referred this entity</td>
</tr>
<tr>
<td>4</td>
<td>Number of URLs that were referred by this entity</td>
</tr>
<tr>
<td>5</td>
<td>Number of search queries</td>
</tr>
</tbody>
</table>

**DateId:** An integer representing the date for which data is being provided. DateId MUST have been calculated using the following formula:

\[ \text{value} = (((\text{year}\times100) + \text{month})\times100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

**Frequency:** Value of MetricType for the specific DateId.

### 2.2.5.26 fn_WA_GetUserDepartments

This table-valued function MUST return a table that represents the user departments of the users with page view or search events for the specified entity in the specified date range.

```
CREATE FUNCTION fn_WA_GetUserDepartments(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

UserDepartment UserDepartmentDataType NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year}\times100) + \text{month})\times100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.
@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

UserDepartment: A string value that specifies the user department.

2.2.5.27 fn_WA_GetUserTitles

This table-valued function MUST return a table that represents the user titles of the users with page view or search events for the specified entity in the specified date range.

CREATE FUNCTION fn_WA_GetUserTitles(@StartDateId, @EndDateId, @AggregationId, @IncludeSubSites)

    UserTitle UserTitleDataType NOT NULL,

@StartDateId: The start date of the data being requested. The type of StartDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@EndDateId: The end date of the data being requested. The type of EndDateId MUST be an integer. The value MUST be calculated as the following:

\[ \text{value} = (((\text{year} \times 100) + \text{month}) \times 100 + \text{day}) \]

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@IncludeSubSites:

UserTitle: A string value that specifies the user title.
2.2.5.28  fn_WA_GetLast24HourNumberOfClickthroughs

CREATE FUNCTION fn_WA_GetLast24HourNumberOfClickthroughs(@AggregationId, @IncludeSubSites, @ContentType, @UserTitle, @UserDepartment)

    PageId AssetIdDataType NULL,
    PageTitle int NULL,
    Frequency bigint NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@includeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ContentType: A string value that specifies that the data MUST be scoped to the specified content type. MUST be NULL when EventType = "Search"

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

PageId: The URL of the visited page.

PageTitle: The title of the visited page.

Frequency: The number of times the PageId was visited in the date range.

2.2.5.29  fn_WA_GetLast24HourNumberOfSearchQueries

CREATE FUNCTION fn_WA_GetLast24HourNumberOfSearchQueries(@AggregationId, @IncludeSubSites, @ScopeName, @UserTitle, @UserDepartment)

    QueryText QueryStringDataType NULL,
    Frequency bigint NULL,

@AggregationId: Identifier of entity for which data is being requested. The type of AggregationId MUST be GUID.

@includeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by AggregationId. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

@ScopeName: A string value that specifies the name of the search scope specified for the query text. MUST be NULL when EventType = "PageView"

@UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

@UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.
**QueryText**: The query text associated with the search query.

**Frequency**: The number of times the **QueryText** was issued in the date range.

### 2.2.5.30 fn_WA_GetNumberOfClickthroughsPerPageIdHash

CREATE FUNCTION fn_WA_GetNumberOfClickthroughsPerPageIdHash(@StartDateId, @Duration, @AggregationId, @IncludeSubSites, @ContentType, @UserTitle, @UserDepartment)

- **ClickedAssetIdHash**: The MD5 Hash of the identifier of the asset that was clicked.
- **Frequency**: The number of times the asset was clicked in the date range.

#### @StartDateId: The start date of the data being requested. The type of **StartDateId** MUST be an integer. The value MUST be calculated as the following:

```
value = (((year*100) + month)*100 + day)
```

where year, month and day are the 4-digit year, 2-digit month and 2-digit day of the date respectively.

#### @Duration: The duration of the current date range and previous date range in number of days. The type of **value** MUST be an integer..

#### @AggregationId: Identifier of entity for which data is being requested. The type of **AggregationId** MUST be GUID.

#### @IncludeSubSites: A Boolean value that specifies if the data being requested SHOULD include the entire hierarchy under the entity specified by **AggregationId**. The value MUST be either 0 or 1. When it is 1 it means data includes the entity and the entire hierarchy under the entity and when it is 0 it means it includes data for the entity only.

#### @ContentType: A string value that specifies that the data MUST be scoped to the specified content type. MUST be NULL when **EventType** = "Search"

#### @UserTitle: A string value that specifies that the data MUST be scoped to the specified user title.

#### @UserDepartment: A string value that specifies that the data MUST be scoped to the specified user department.

### 2.2.6 XML Structures

No XML structures are defined in this protocol.

#### 2.2.6.1 Namespaces

This specification does not define any common XML Schema Namespaces definitions.

#### 2.2.6.2 Simple Types

This specification does not define any common XML Schema simple types definitions.
2.2.6.3 Complex Types
This specification does not define any common XML Schema complex types definitions.

2.2.6.4 Elements
This specification does not define any common XML Schema elements definitions.

2.2.6.5 Attributes
This specification does not define any common XML Schema attributes definitions.

2.2.6.6 Groups
This specification does not define any common XML Schema groups definitions.

2.2.6.7 Attribute Groups
This specification does not define any common XML Schema attribute groups definitions.
3 Protocol Details

3.1 Server Details

The database server responds to table-valued function calls. Each table-valued function call returns a table. The protocol never initiates communication with other endpoints of the protocol.

3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

The server stores data about page view events, search events and utilization of various entities such as storage, site, templates in the farm. The server aggregates such data and makes them available via table-valued functions. The table-valued functions specified in this protocol are stateless and can be called in any order.

3.1.2 Timers

None.

3.1.3 Initialization

Before using this protocol, a connection that uses the underlying protocol layers specified in section 1.4, Relationship to Other Protocols, MUST be established as specified in [MS-TDS].

3.1.4 Higher-Layer Triggered Events

None.

3.1.5 Message Processing Events and Sequencing Rules

None.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Client Details

None.

3.2.1 Abstract Data Model

None.
3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

None.

3.2.5 Message Processing Events and Sequencing Rules

None.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.
4 Protocol Examples

The following examples contain a sample interaction between the protocol client and the protocol server.

4.1 Obtaining Information About Web Traffic Volume

The protocol client MAY request information about the web traffic volume in the last 30 days. The following shows the request that MAY be sent to the protocol server:

```
SELECT * FROM [Web Analytics Service Application_Reporting_DB_c65079d6-c620-438f-9270-1360b54871a6].[dbo].[fn_WA_GetTrafficVolumePerDay] ( 20090510, 20090608, '19dda115-1550-3943-729a-df3828df9352', 1, 1)
```

The protocol server MAY return the following table:

<table>
<thead>
<tr>
<th>DateId</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20090519</td>
<td>2</td>
</tr>
<tr>
<td>20090520</td>
<td>9</td>
</tr>
<tr>
<td>20090525</td>
<td>5</td>
</tr>
<tr>
<td>20090529</td>
<td>1</td>
</tr>
<tr>
<td>20090530</td>
<td>1</td>
</tr>
<tr>
<td>20090601</td>
<td>5</td>
</tr>
<tr>
<td>20090602</td>
<td>24</td>
</tr>
<tr>
<td>20090603</td>
<td>13</td>
</tr>
<tr>
<td>20090604</td>
<td>1</td>
</tr>
<tr>
<td>20090605</td>
<td>6</td>
</tr>
</tbody>
</table>

4.2 Obtaining Information About the Top Pages Visited

The protocol client MAY request information about the top pages visited in the last 30 days. The following shows the request that MAY be sent to the protocol server:

```
SELECT * FROM [Web Analytics Service Application_Reporting_DB_c65079d6-c620-438f-9270-1360b54871a6].[dbo].[fn_WA_GetTopPages] ( 20090510, 20090608, '19dda115-1550-3943-729a-df3828df9352', 1, 'PageView')
```
The protocol server MAY return the following table:

<table>
<thead>
<tr>
<th>PageId</th>
<th>PageTitle</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://contoso.com/searchcenter/pages/default.aspx">http://contoso.com/searchcenter/pages/default.aspx</a></td>
<td>Search Center</td>
<td>1</td>
<td>1.492537</td>
</tr>
<tr>
<td><a href="http://contoso.com/reports/pages/default.aspx">http://contoso.com/reports/pages/default.aspx</a></td>
<td>Contoso</td>
<td>1</td>
<td>1.492537</td>
</tr>
<tr>
<td><a href="http://contoso.com/pages/newpage0601-1356.aspx">http://contoso.com/pages/newpage0601-1356.aspx</a></td>
<td>My page</td>
<td>1</td>
<td>1.492537</td>
</tr>
<tr>
<td><a href="http://contoso.com/docs/default.aspx">http://contoso.com/docs/default.aspx</a></td>
<td>Main page</td>
<td>1</td>
<td>1.492537</td>
</tr>
<tr>
<td><a href="http://contoso.com/_layouts/chart/webui/controls/chartpreviewimage.aspx">http://contoso.com/_layouts/chart/webui/controls/chartpreviewimage.aspx</a></td>
<td>Charts</td>
<td>47</td>
<td>70.14925</td>
</tr>
<tr>
<td><a href="http://contoso.com/searchcenter/pages/results.aspx">http://contoso.com/searchcenter/pages/results.aspx</a></td>
<td>results</td>
<td>5</td>
<td>7.462687</td>
</tr>
</tbody>
</table>

4.3 Obtaining Information About the Top Visitors

The protocol client MAY request information about the top visitors in the last 30 days. The following shows the request that MAY be sent to the protocol server:

```sql
SELECT * FROM [Web Analytics Service Application_Reporting_DB_c65079d6-c620-438f-9270-1360b54871a6].[dbo].[fn_WA_GetTopVisitors] (20090510, 20090608, '19dda115-1550-3943-729a-df3828df9352', 1)
```

The protocol server MAY return the following table:

<table>
<thead>
<tr>
<th>UserName</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe_user</td>
<td>5</td>
<td>7.462687</td>
</tr>
<tr>
<td>John_user</td>
<td>54</td>
<td>80.59702</td>
</tr>
<tr>
<td>Jack_user</td>
<td>8</td>
<td>11.9403</td>
</tr>
</tbody>
</table>
5 Security

5.1 Security Considerations for Implementers

Interactions with SQL are susceptible to tampering and other forms of security risks. Implementers are advised to sanitize input parameters for table-valued functions prior to invoking the table-valued function.

There are no additional security considerations for implementers. Security assumptions of this protocol are documented in Versioning and Capability Negotiation.

5.2 Index of Security Parameters

None.
6 Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® FAST™ Search Server 2010
- Microsoft® SharePoint® Server 2010

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.
7 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.
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  fn_WA_GetLast24HourSearchQueryChanges 14
  fn_WA_GetLast24HourUserDepartments 15
  fn_WA_GetLast24HourUserTitles 15
  fn_WA_GetNumberOfClickthroughs 15
  fn_WA_GetNumberOfFailedSearchQueriesPerDay 17
  fn_WA_GetNumberOfSearchQueries 18
  fn_WA_GetNumberOfSearchQueriesPerDay 19
  fn_WA_GetSearchQueryChanges 21
  fn_WA_GetSummary 22
  fn_WA_GetTopBrowsers 23
  fn_WA_GetTopDestinations 24
  fn_WA_GetTopFailedSearchQueries 25
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[MS-MAVA] — v20120630
Microsoft Office SharePoint Server (MOSS) Analytics View Access Protocol Specification
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