White Paper

EMC Ionix ControlCenter 6.1 StorageScope and Invista Integration

Applied Technology

Abstract

This white paper describes the steps necessary to discover and report on EMC® Invista® in Ionix™ ControlCenter® 6.1.

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Executive summary

EMC® Ionix™ ControlCenter® 6.1 Update Bundle 3 (UB3) introduced support for the EMC Invista® SAN virtualization product line. Support for the EMC Invista configuration data is provided through StorageScope™ queries. These preconfigured queries provide an end-to-end view of the virtual SAN environment. With the queries, the user can identify the logical mappings from the server file systems, to the virtual devices, and finally to the back-end arrays.

Introduction

This white paper discusses the steps required to discover and report on EMC Invista in an EMC Ionix ControlCenter environment. For detailed information on agent installation, environment support requirements, and prerequisites, please refer to *EMC Ionix ControlCenter Planning and Installation Guide – Volume 1*, and the *EMC Ionix ControlCenter Performance and Scalability Guidelines*, as well as the *EMC Ionix ControlCenter Support Matrix*. These important documents can be downloaded from Powerlink®.

Audience

The intended audience for this white paper includes system administrators and storage administrators who are responsible for maintaining the EMC Ionix ControlCenter application.

Terminology

The following are definitions of concepts used throughout this white paper.

- Assisted Discovery Dialog (ADA) - A feature in the ControlCenter Console that allows users to discover various objects over TCP/IP by passing server information, user credentials, and protocols that are used to discover the objects.
- Data Collection Policy (DCP) - A policy that is executed by the agents at a predefined interval. The DCP is executed by the agents. The most common type of policy is the discovery policy, which all managed objects have.
- Extract, Transform, and Load (ETL) - The process of extracting data from one repository, reformatting the data, and then loading it into another repository.
- Invista - Invista enables the virtualization of storage in networked storage environments that dramatically reduces the amount of downtime associated with the movement of data across storage tiers.
- Managed Object (MO) - An entity that has been discovered in ControlCenter and is being managed by an agent. Examples of MOs are hosts, storage arrays, databases, and file systems.
- Stored Procedure – A subroutine that is called during the discovery. The stored procedure contains the user-provided data entered during the assisted discovery. The stored procedure is stored in encrypted tables within the ControlCenter Repository for future use.

Deploying the Invista agent

The first step in discovering the EMC Invista in EMC Ionix ControlCenter is to deploy the agent for Invista to a Windows server. The agent is installed like all other agents by right-clicking on the host in the tree panel and then drilling down through the Agents context menu. Prior to deploying the Invista agent, the following prerequisites must be met.

- A supported Windows server is needed to install the ControlCenter Invista agent.
- Invista CLI (INVCLI) 2.1 needs to be installed on the Windows server where the agent will be deployed.

- The EMC Invista to be discovered must be at the 2.0, 2.1, or 2.3 version.
- Network connectivity must exist between the Windows server where the Invista agent is installed and the Invista.
- ControlCenter Update Bundle 3 or later must be installed.
- A ControlCenter user account with the required privileges to discover the Invista must exist.

For up-to-date support information, please reference the latest *EMC Ionix ControlCenter 6.1 Support Matrix* available on Powerlink.

The Invista agent leverages the locally installed Invista CLI (INVCLI) to discover the Invista over a TCP/IP connection. Only one Invista agent should be needed per environment. However, please reference the *EMC Ionix ControlCenter Performance and Scalability Guidelines* for up-to-date scalability information. A second Invista agent can be installed on a second Windows host to provide redundancy.

In order to get the end-to-end relationship, host agents and storage agents will also need to be installed. The deployment of these agents and discovery of these objects are outside the scope of this white paper and will not be discussed.

Discovery of Invista

Prior to discovering the Invista, test connectivity between the Windows host running the Invista agent and the Invista virtual storage by running INVCLI or INVSecCLI with the getagent option (Figure 1 and Figure 2). Utilize the "-h" option when running the invcli command and provide the hostname of the storage processor. When using invseccli, utilize the "-h" option with the hostname of the storage processor as well as the "-User" option with the defined user.

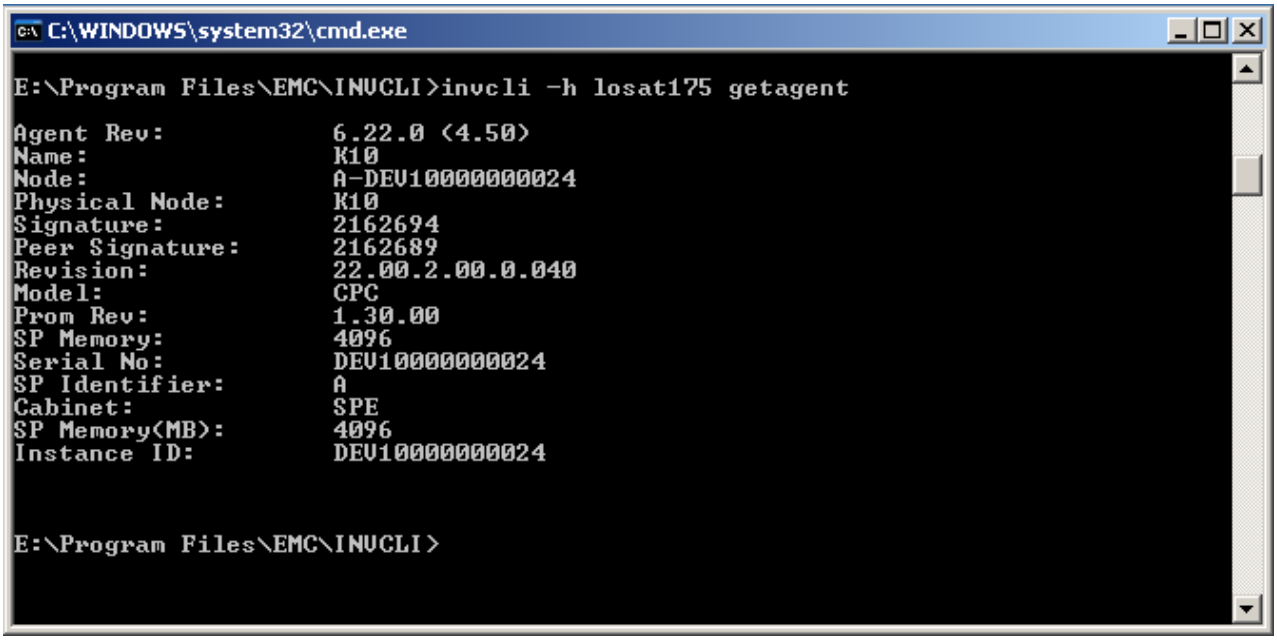

Figure 1. invcli example

```
C:\WINDOWS\system32\cmd.exe

E:\Program Files\EMC\InvSecCli>InvSECCli -User emc -h losat175 getagent
Enter Password : ********

Agent Rev:            6.22.0 (4.50)
Name:                 K10
Node:                 A-DEV10000000024
Physical Node:        K10
Signature:            2162694
Peer Signature:       2162689
Revision:             22.00.2.00.0.040
Model:                CPC
Prom Rev:             1.30.00
SP Memory:            4096
Serial No:            DEV10000000024
SP Identifier:        A
Cabinet:              SPE
SP Memory(MB):        4096
Instance ID:          DEV10000000024


E:\Program Files\EMC\InvSecCli>
```

Figure 2. invseccli example

To discover the Invista in ControlCenter you must utilize the Assisted Discovery Dialog (ADA) in the console (Figure 3). Assisted discovery is performed on all objects that are discovered over TCP/IP.

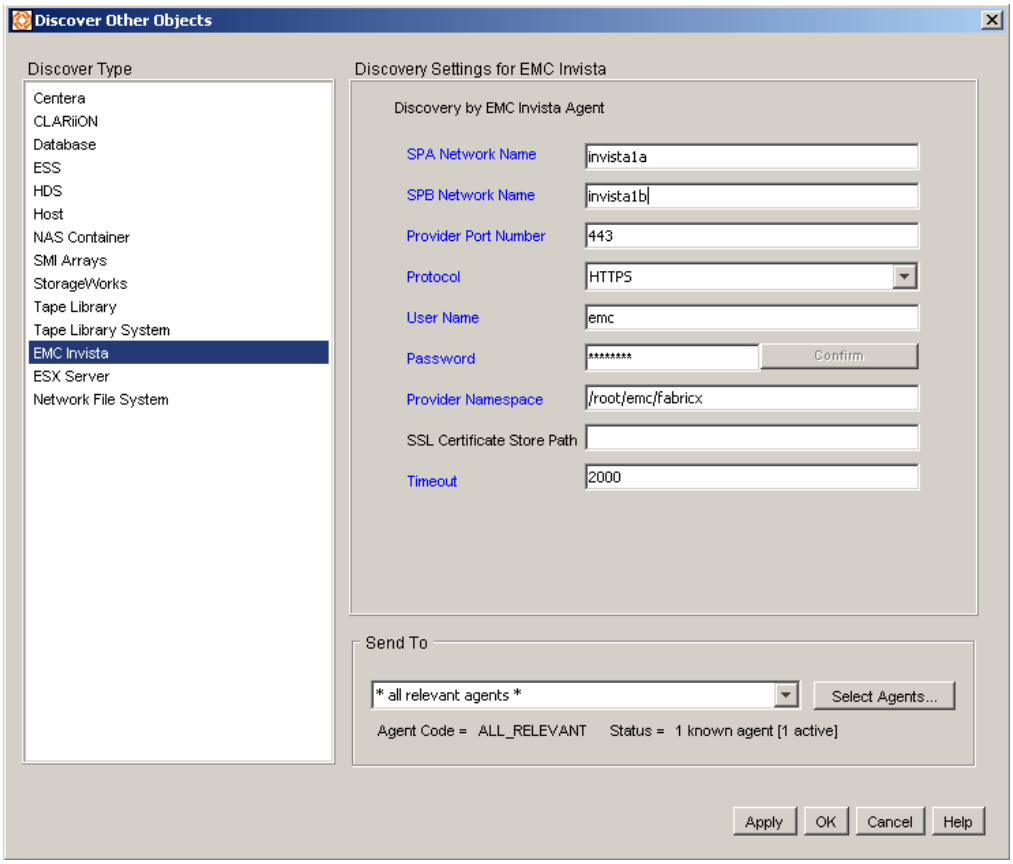

Figure 3. Assisted Discovery dialog box

The following fields display:

- SPA Network Name – Network name of the storage processor A (SPA) of the Control Path Processor of the Invista instance to be discovered.
- SPB Network Name – Network name of the storage processor B (SPB) of the Control Path Processor of the Invista instance to be discovered.
- Provider Port Number - CIMOM port number on Invista.
- Protocol - Allowable values are HTTPS and HTTP. If set to HTTPS, HTTPS communication will be attempted with CIMOM using the Provider port number. If set to HTTP, HTTP communication will be attempted using the Provider port number. Default setting is HTTPS.
- User Name - Username to access the Invista.
- Password – The password for the username that will access the Invista.
- Provider Namespace - NameSpace communicates with the provider. The default is "/root/emc/fabric". In the future, if Invista supports multiple namespaces, this field could contain several values.
- SSL Certificate Store Path - Currently not used. Invista does not require client certificate authentication.
- Timeout - Timeout for CIM connection with CIMOM.

You can also check the progress of a discovery by clicking the **ECC Administration** button and then selecting the **Discover > Review Progress menu.** In the resulting Review Discovery Results window, select **EMC Invista** in the Discover Type field as shown in Figure 4. In the Review Progress dialog box you can review the progress of the current discovery attempt, any error messages if an error is encountered during discovery, and the contents of the stored procedure. The stored procedure is a subroutine stored in the ControlCenter Repository, which is called during the discovery or rediscovery of the Invista.

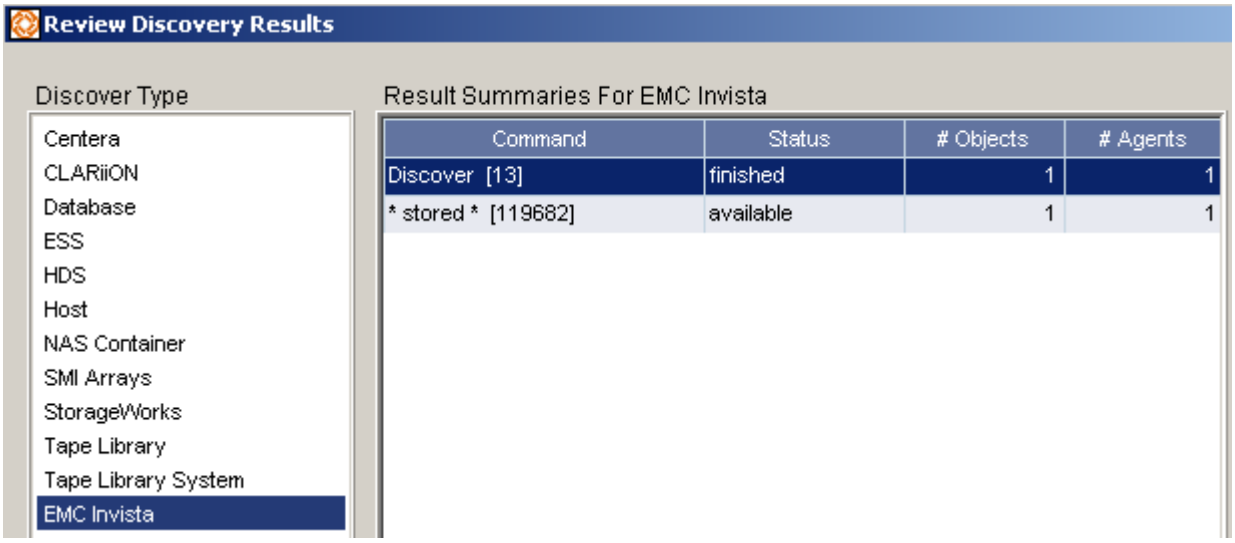

Figure 4. Review Discovery Results window

If errors are encountered during an assisted discovery, consult the Assistance Result Details window of the Review Discovery Results window for more information. Once the issue is identified, it is best practice to select the command titled ***stored*** and click the **Delete** button, and then attempt another discovery. This will ensure that if the failure was a result of incorrect credentials (for example, username, SP name, protocol) that the bad stored procedure is removed from the repository. Only stored procedures with a 0 in the # Objects column should be deleted. The Invista agent must be stopped to delete any stored procedure from this window.

Console properties

Once the EMC Invista is discovered via ADA, the default enabled discovery policy (DCP) will rediscover the Invista every night at midnight. The schedule for this policy can be modified if needed. Please reference online help and the *EMC Ionix ControlCenter Performance and Scalability Guidelines* for more information. When the discovery is complete, the Invista will appear under the Storage Systems folder in the Tree pane as shown in Figure 5.

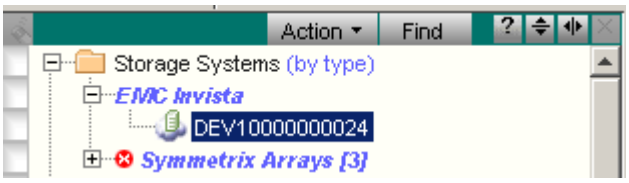

Figure 5. EMC Invista shown in the Tree pane

The Invista can be added to a Properties view to get high-level capacity information. Figure 6 shows the various properties that can be displayed for the Invista.

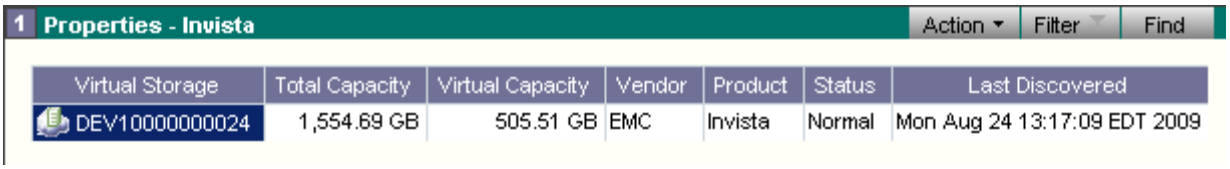

Figure 6. Properties view

You can also configure the console so that the Invista Element Manager can be launched from the context menu in the ControlCenter Console. To do this, right-click the Invista and select **Management Tools > Edit**. In the resulting Edit Management Tools window, click the **New** button, enter the URL to the EMC Invista Element Manager, and enter a description. This is shown in Figure 7.

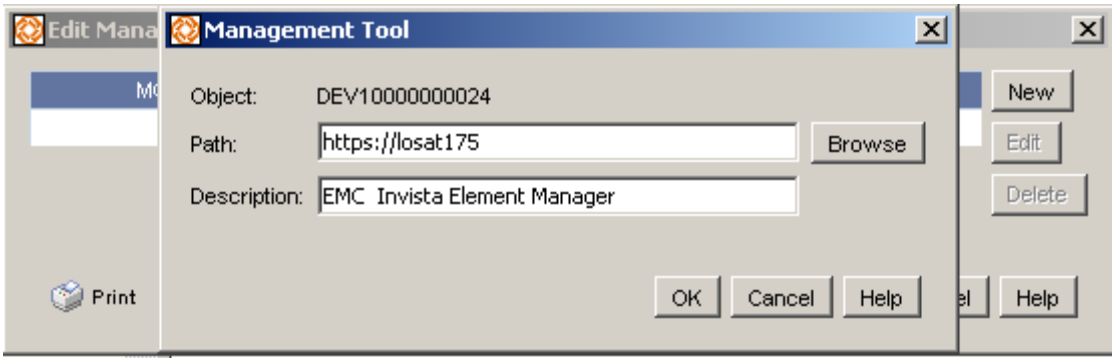

Figure 7. Management Tool

Now when you right-click the EMC Invista within the ControlCenter Console, the Element Manager will be available under the Management Tools menu.

StorageScope Query Builder

StorageScope Query Builder can be used to get detailed capacity information as well as an end-to-end relationship of the Invista. As mentioned when discussing the prerequisites, in order to obtain the end-to-end relationship in StorageScope, the storage array and servers connected to the Invista will also need to be discovered using the appropriate agents. If these agents are not deployed and the managed objects (MO) are not discovered, then the only information available in StorageScope regarding the Invista will be storage

utilization. The ETL process will also need to be run after the initial discovery of the Invista. The ETL process can be run manually or scheduled in the StorageScope UI.

Update Bundle 3 for Ionix ControlCenter 6.1 provides three built-in queries.

- Virtual Storage Utilization (Figure 8) – Lists how much of each storage array would be available to and utilized by each Invista instance in your managed environment.
- Virtual Storage Relationship View (Figure 9) - Lists end-to-end relationships between host volumes and array storage in your managed environment.
- Host Virtual Storage Utilization (Figure 10) – Lists the virtual storage utilized by hosts.

1 rows - Page 1 of 1

Virtual Storage: Virtual Storage Alias ▲1	Virtual Storage: Virtual Storage Type	Virtual Storage: Virtual Storage Model	Virtual Storage: Total Capacity (GB)	Virtual Storage: Imported Capacity (GB)	Virtual Storage: Unimported Capacity(GB)	Virtual Storage: Virtual Capacity (GB)	Virtual Storage: Host Allocated (GB)	Virtual Storage: Accessible to Host(GB)	Virtual Storage: Used Host Accessible (GB)
DEV10000000024	Invista	N/A	1,554.69	930.62	624.07	505.51	225.00	225.00	79.98

Figure 8. Example of a storage utilization query

4 rows - Page 1 of 1

Hosts: Host Name ▲1	Hosts: Host OS	File Systems: File System Name ▲2	File Systems: File System (GB)	Host Devices: Host Device Name	Host Devices: Host Device Capacity (GB)	Virtual Storage: Virtual Storage Alias	Virtual Storage: Total Capacity (GB)	Virtual Device: Virtual Device Alias	Virtual Device: Virtual Device Capacity (GB)	Virtual Device: Virtual Meta Device Total (GB)	Virtual Disk: Virtual Disk Name	Virtual Disk: Virtual Disk Capacity (GB)	Arrays: Array Name	Arrays: Array Type	LUNs: LUN Name	LUNs: LUN Capacity (GB)	LUNs: Assignable Device Capacity (GB)
losar025	Windows Server 2003	G:\	25.00	\\.\PHYSICALDRIVE12	25.00	DEV10000000024	1,554.69	60001440FFE0008D00750B700600006F	25.00		0_9_0	300.00	APM00064302686	Clariion	0022	0.00	300.00
losar025	Windows Server 2003	K:\	25.00	\\.\PHYSICALDRIVE32	25.00	DEV10000000024	1,554.69	60001440FFE0008D00750BA006000073	25.00		0_9_1	100.00	APM00064302686	Clariion	0025	100.00	100.00
losar025	Windows Server 2003	L:\	25.00	\\.\PHYSICALDRIVE33	25.00	DEV10000000024	1,554.69	60001440FFE0008D00750BB006000075	25.00		0_9_1	100.00	APM00064302686	Clariion	0025	100.00	100.00
losar025	Windows Server 2003	T:\	4.99	\\.\PHYSICALDRIVE18	4.99	DEV10000000024	1,554.69	60001440FFE0008D00CCFA70060000FA	5.00		0_7_7	10.07	000187700037	Symmetrix	40B3	10.07	10.07

Figure 9. Example of a relationship query

1 rows - Page 1 of 1

Hosts: Host Name ▲1	Hosts: Host OS	Hosts: Accessible - Array(GB)	Hosts: Used Accessible - Array (GB)	Hosts: Accessible from Virtual Storage(GB)	Hosts: Used Accessible on Virtual Devices(GB)
losar025	Windows Server 2003	0.00	0.00	226.95	79.98

Figure 10. Example of host virtual storage utilization query

Conclusion

This white paper provided step-by-step instructions on how to discover an Invista in the EMC Ionix ControlCenter application. It also provided examples of the built-in StorageScope queries that can be used for reporting on the end-to-end relationship in a virtual storage environment as well as storage utilization details.