Session 1137: Automated Server Provisioning with Adaptive Infrastructure

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Solutions and Technology Conference & Expo

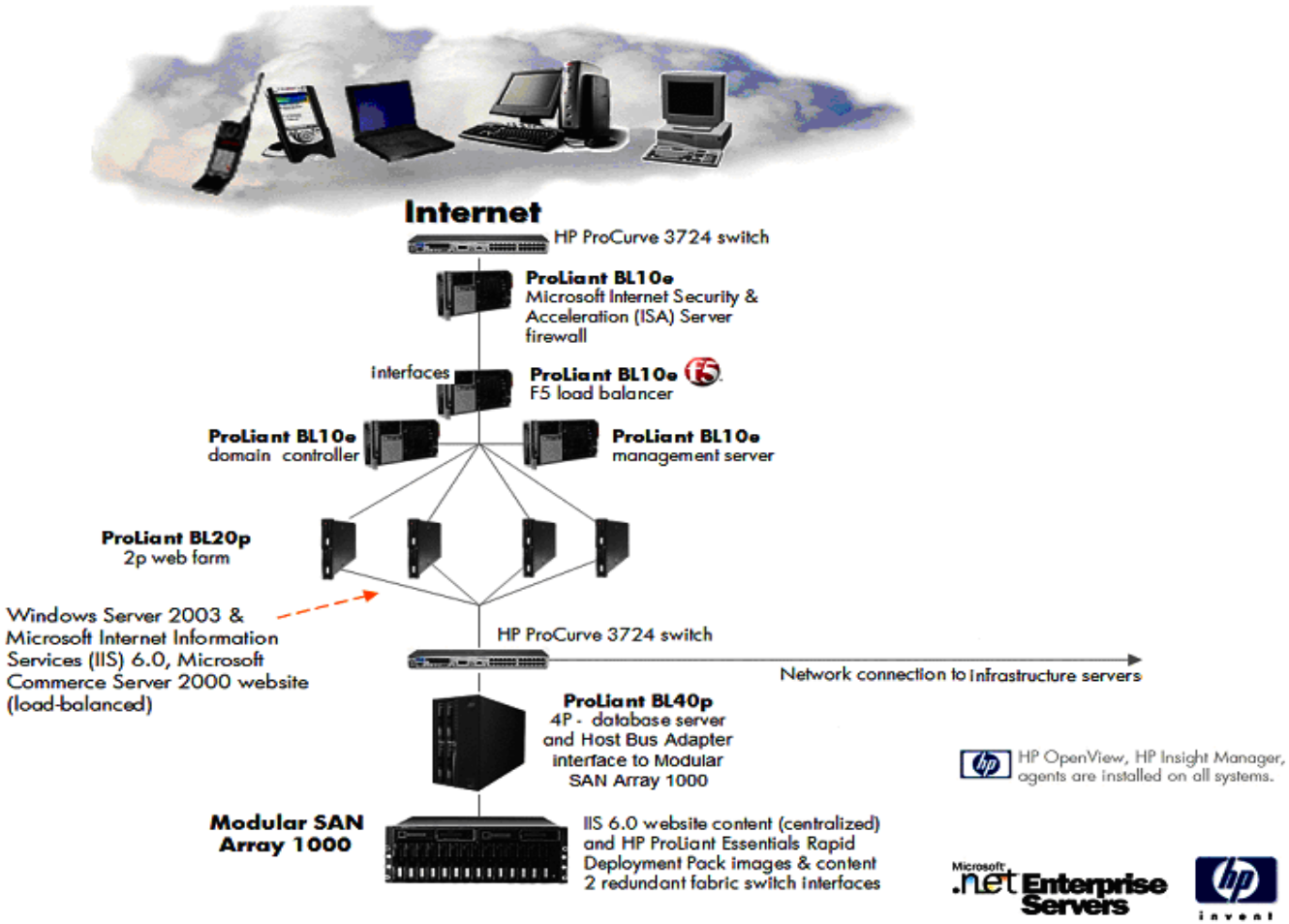
Introduction

- Automated provisioning of HP ProLiant Servers
  - Various pieces
- What is the toolkit?
  - Overview
  - Source code how-to
  - Integration how-to

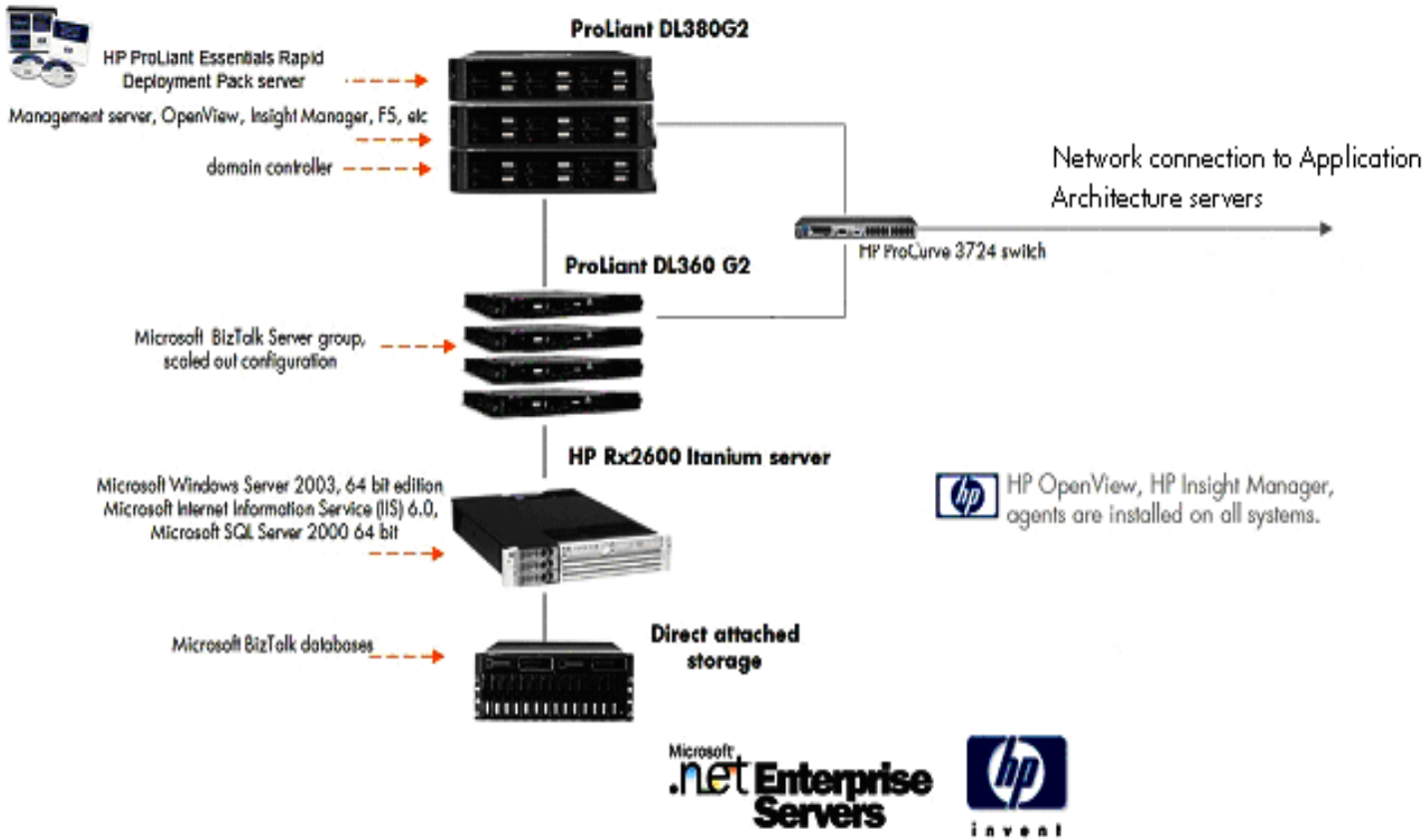
Overview of toolkit contents

- Overview Presentation on the Toolkit for Automated Provisioning
- Automated Provisioning Scale-out Scenario Video
- Utilization Monitoring Web Application
- Provisioning Management Web Service
- Orchestration Schedules for Automated Provisioning
- MSMQ Drop Web Service
- Perfmon Web Service
- ProLiant Essentials RDP Adapter for Automated Provisioning
- Load Balancing Adapters for Automated Provisioning
- RiLOE .NET Web Service

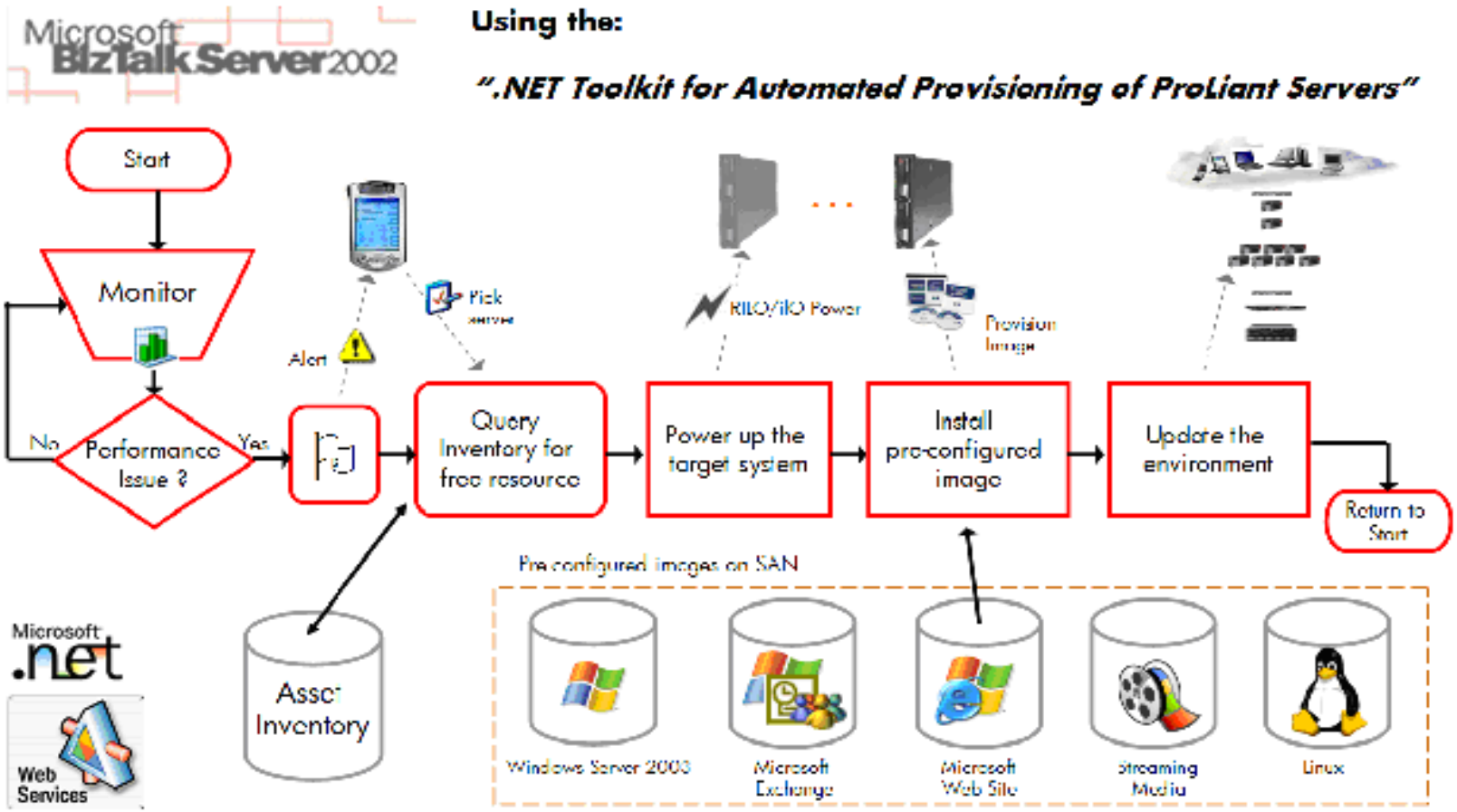
Application architecture



Infrastructure servers



Provisioning process flow

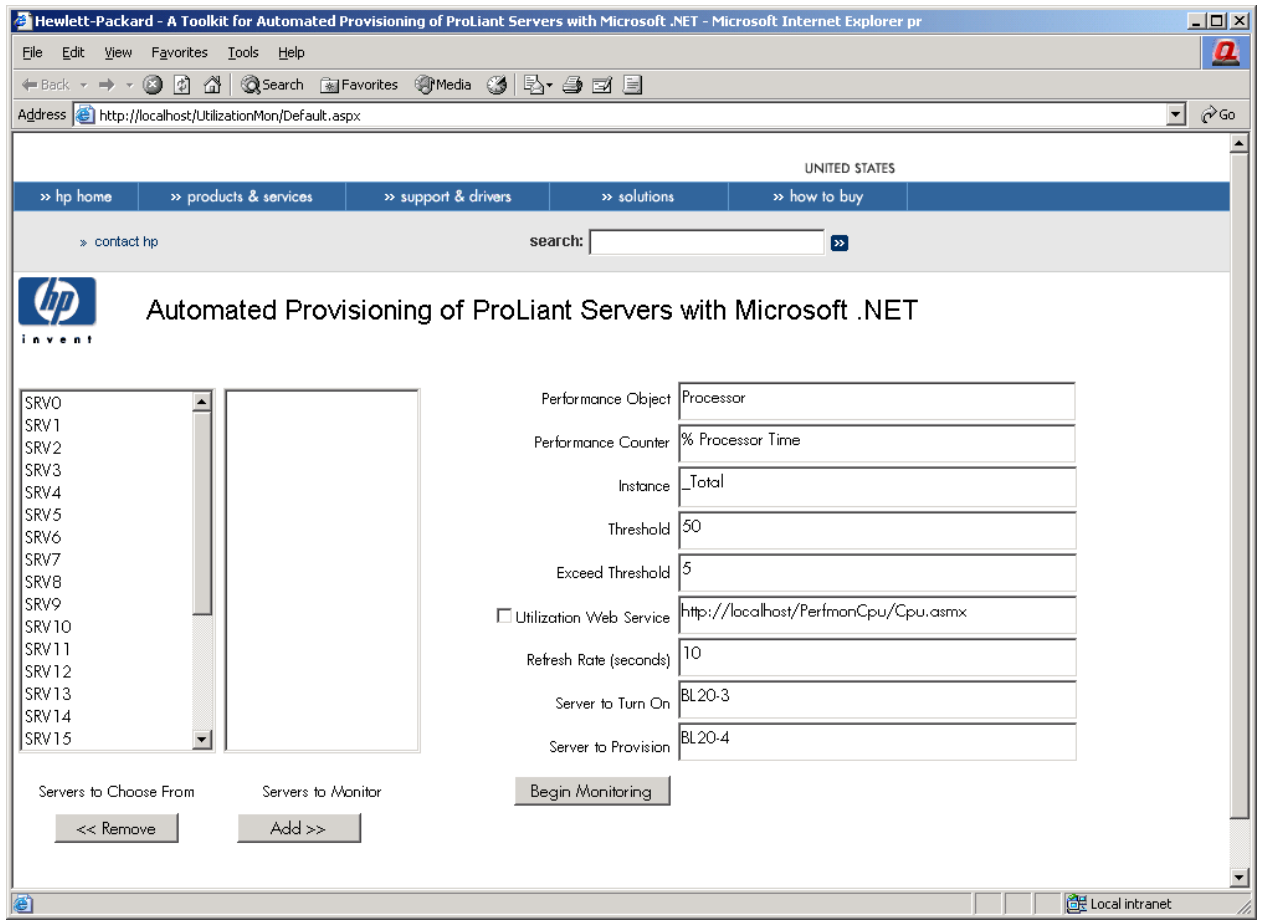


Utilization Monitoring Web Application

- A Utilization Monitoring Web Application for Automated Provisioning with Microsoft .NET allows administrators to:
  - Define the different servers that comprise a server farm
  - Define a utilization indicator that they wish to monitor across the server farm
  - View real-time data of the monitored indicator for each individual server in the farm and in aggregate for all servers in the farm
  - Define two events to be triggered whenever the monitored indicator exceeds a pre-defined threshold a pre-defined number of times

Utilization Monitoring Web Application

- **Default.aspx** a web-based GUI interface for viewing utilization statistics of individual servers or groups of servers



Utilization Monitoring Web Application

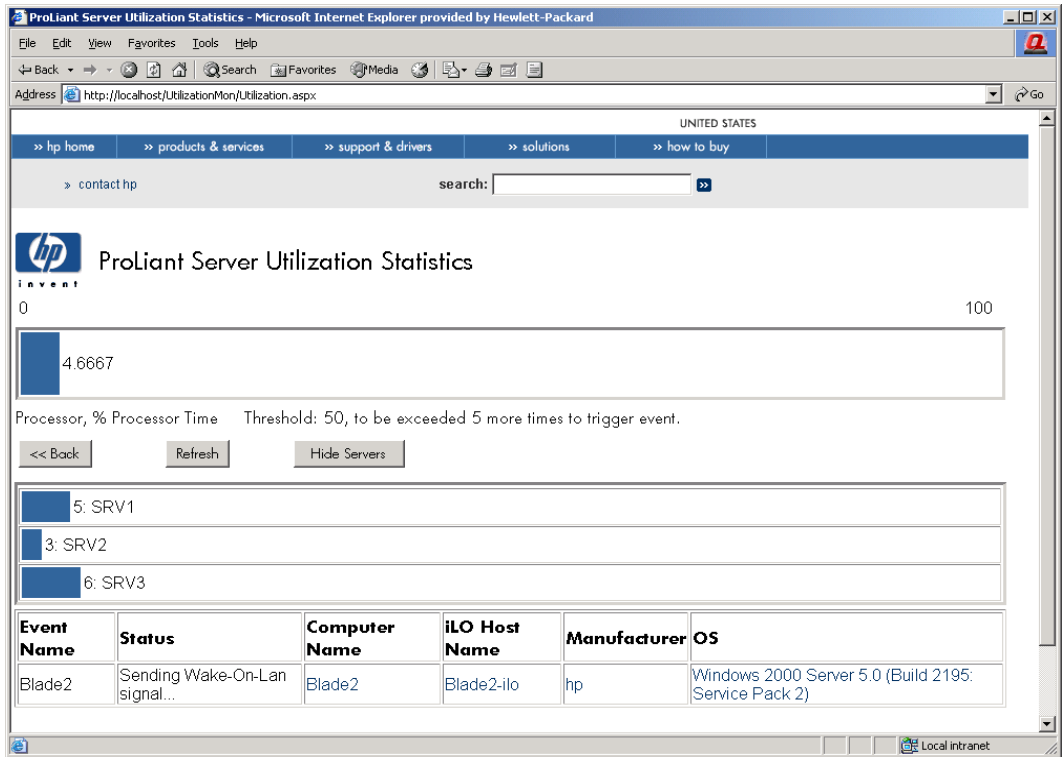
- The list of servers from which to select is generated by invoking the GetImDeviceNames web method within the ProvisionMgmt Web Service located on the same host as the host running the HP Utilization Monitor Web Application
- The Windows® Performance Monitor Performance Object, Performance Counter and Instance that are to be monitored or:
- A Utilization Web Service
  - If performance data other than perfmon is used, the web service must implement a specific WSDL to bind to the application and the **Utilization Web Service** box must be checked

Utilization Monitoring Web Application

- Refresh rate
  - determines how often a check for performance utilization is made
- Server to turn on
  - name of a server to turn on in response to a performance utilization statistic exceeding the specified threshold
- Server to provision
  - name of a Server to Provision in response to a performance utilization statistic exceeding the specified Threshold

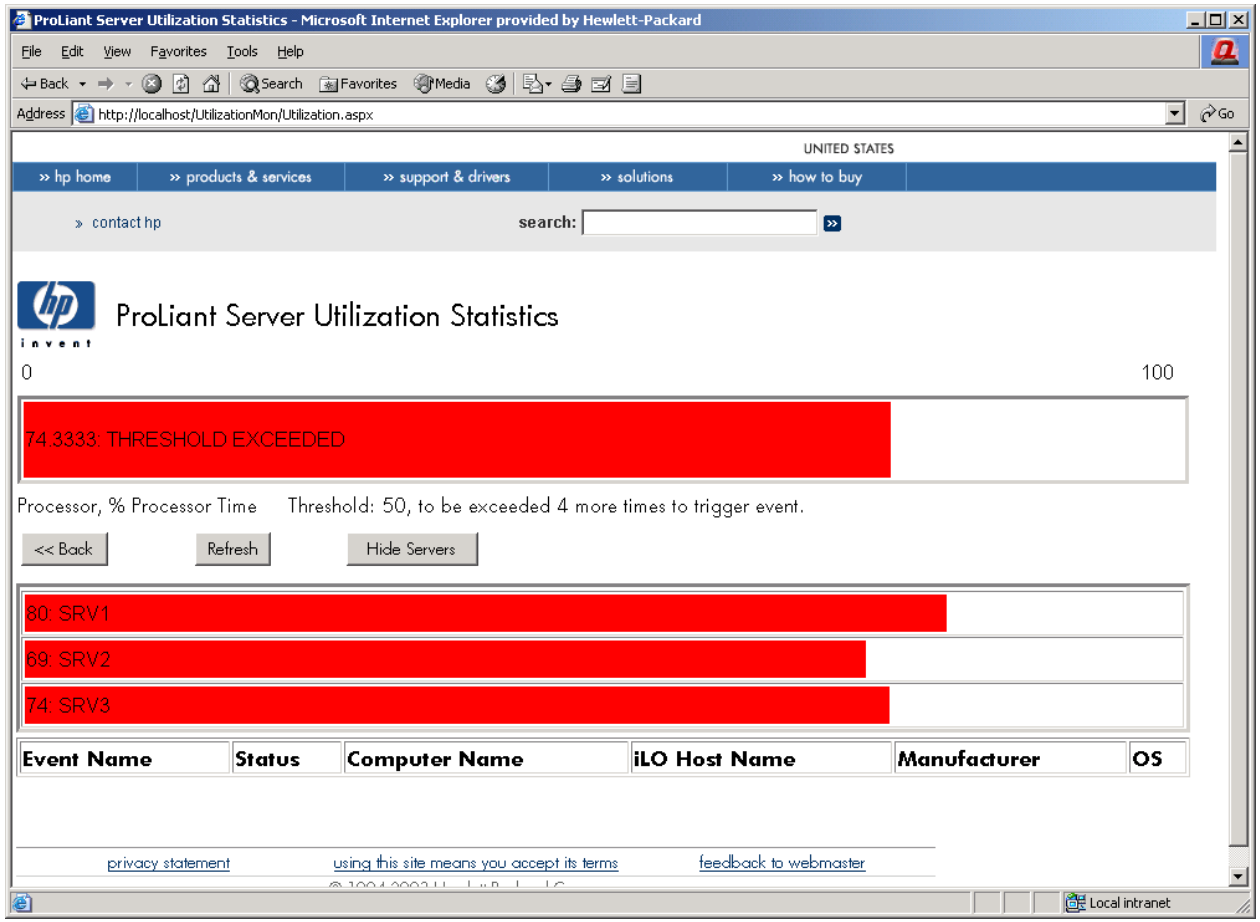
Utilization Monitoring Web Application

- Utilization.aspx provides the user with a view of three pieces of information:
  - Average Utilization Bar Chart
  - Individual Server Utilization Bar Chart
  - RDP Event Chart



Utilization Monitoring Web Application

- Threshold exceeded



Provisioning Management Web Service

- A .NET Web Service written to provide access to real-time event information from ProLiant Essentials Rapid Deployment Pack (RDP) as well as from HP Insight Manager server element information
- The Provisioning class is the .NET Web Service class written to extract RDP and Insight Manager information, has two dynamic variable members
  - m_strSqlRapiDeploy
  - m_strSqlInsightManager
  - used to store SQL Server connection strings for the RDP and Insight Management databases

Provisioning Management Web Service

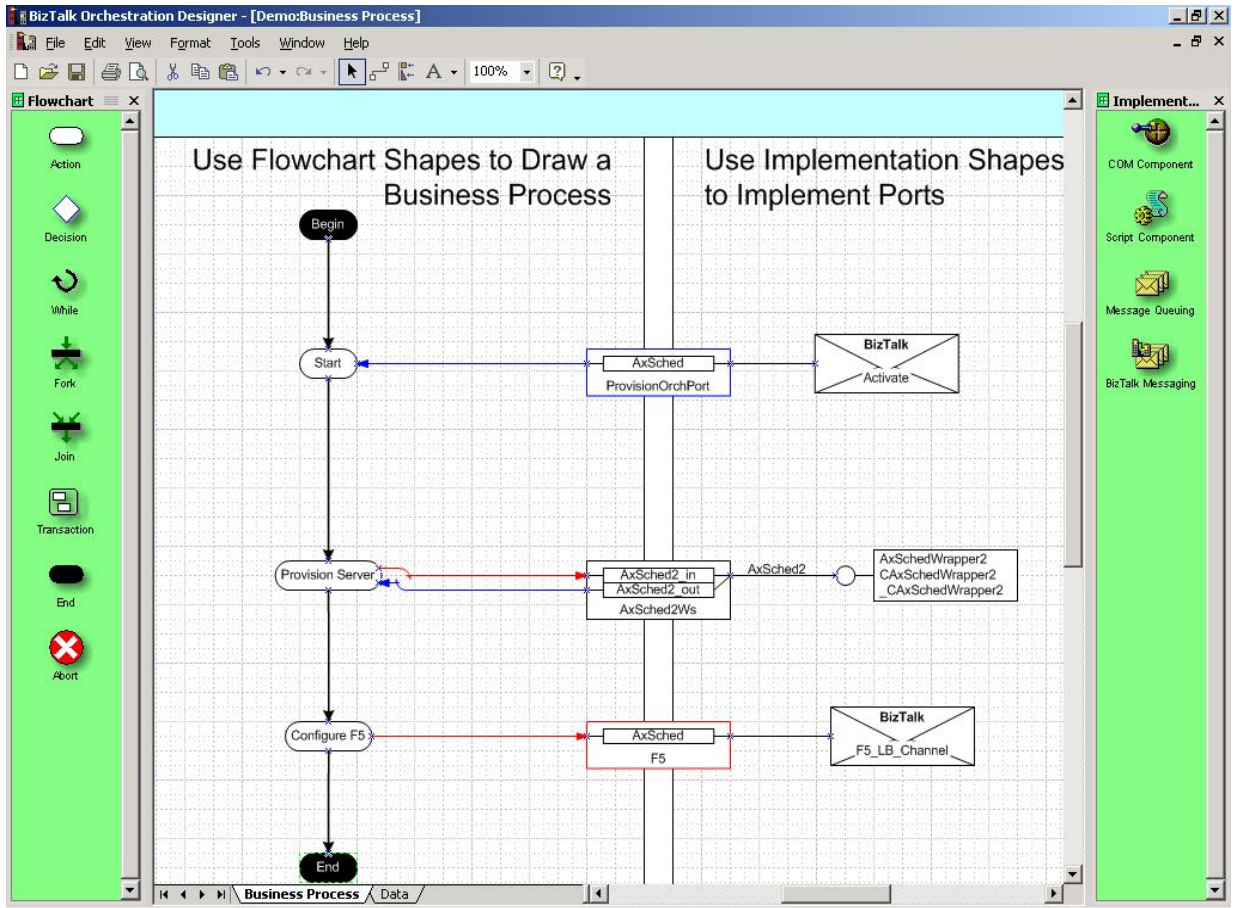
- The GetEventInfo() web method
  - Pulls all current RDP events from the event_schedule RDP database table
  - Next, it pulls relevant computer information from the computer RDP database table
  - Finally, it checks for the existence of each computer in Insight Manager by cross-referencing the computer serial number as a GUID in the devices Insight Manager database table
- The GetImDeviceNames() web method
  - Returns all device names from the Insight Manager devices database table

Provisioning Management Web Service

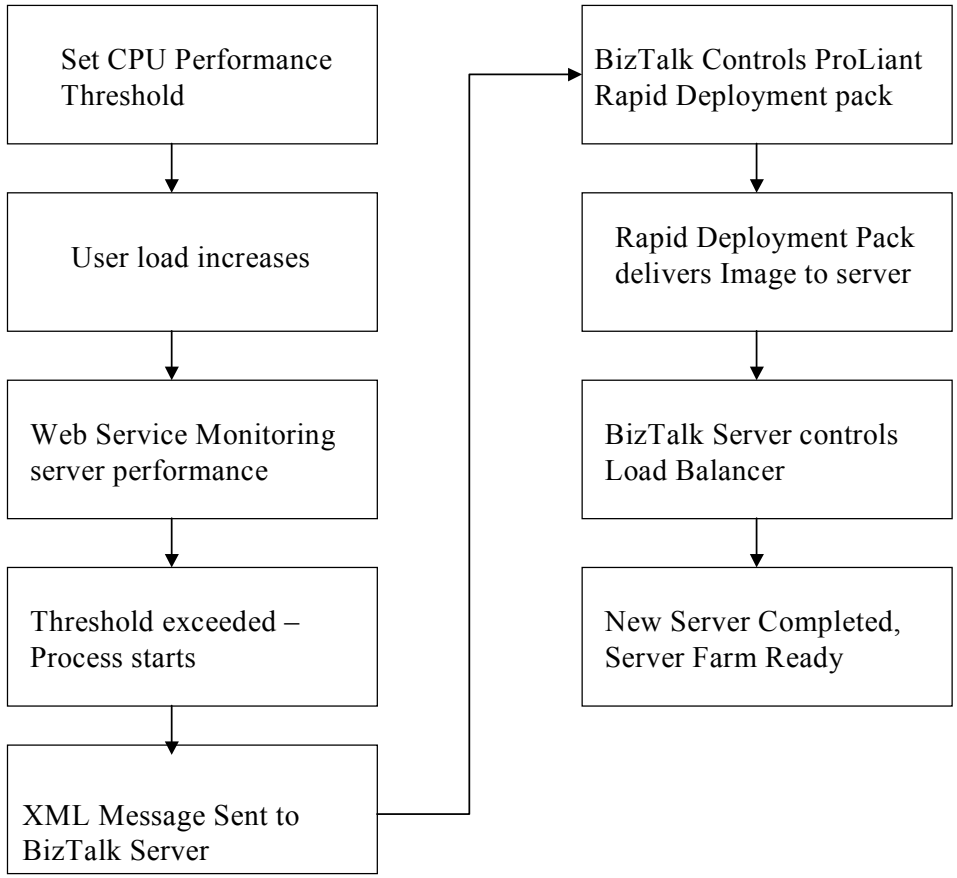
- The GetAllImDeviceNamesAndIds () web method
  - Returns all device names and DeviceKeys from the Insight Manager devices database table
  - Very similar to the code for GetEventInfo(), except that it looks through a single database table with no cross references rather than two cross-referenced tables
- For complete source code see document:
  - provisioning management web service for automated provisioning on toolkit

Orchestration Schedules for Automated Provisioning

- Microsoft BizTalk Server 2002 serves as the orchestration and rules engine for the business process



Orchestration Schedules for Automated Provisioning



Orchestration Schedules for Automated Provisioning

- XML message to start process:

```
- <AxSched>
  <ComputerOrGroup>Blade1</ComputerOrGroup>
  <EventName>Deploy Image</EventName>
- <Options>
  <Time />
  <DontNotify>false</DontNotify>
  <DSN />
  <DatabaseServer>Deploy</DatabaseServer>
  <DatabaseUser>sa</DatabaseUser>
  <DatabasePassword>hp</DatabasePassword>
  <DeploymentUser />
  <DeploymentPassword />
  </Options>
  <PoolName>AdaptiveEnterprise</PoolName>
  <IpAddress>11.11.11.25</IpAddress>
  <Port>80</Port>
 </AxSched>
```

Orchestration Schedules for Automated Provisioning

- AxSched, provides parameters for Rapid Deployment Pack

```
- <AxSched>
  <ComputerOrGroup>Blade1</ComputerOrGroup>
  <EventName>Deploy Image</EventName>
-
```

- Options, provides parameters for Rapid Deployment Pack

```
- <Options>
  <Time />
  <DontNotify>false</DontNotify>
  <DSN />
  <DatabaseServer>Deploy</DatabaseServer>
  <DatabaseUser>sa</DatabaseUser>
  <DatabasePassword>hp</DatabasePassword>
  <DeploymentUser />
  <DeploymentPassword />
  </Options>
```

Orchestration Schedules for Automated Provisioning

- Parameters for F5 Blade Controller Software:

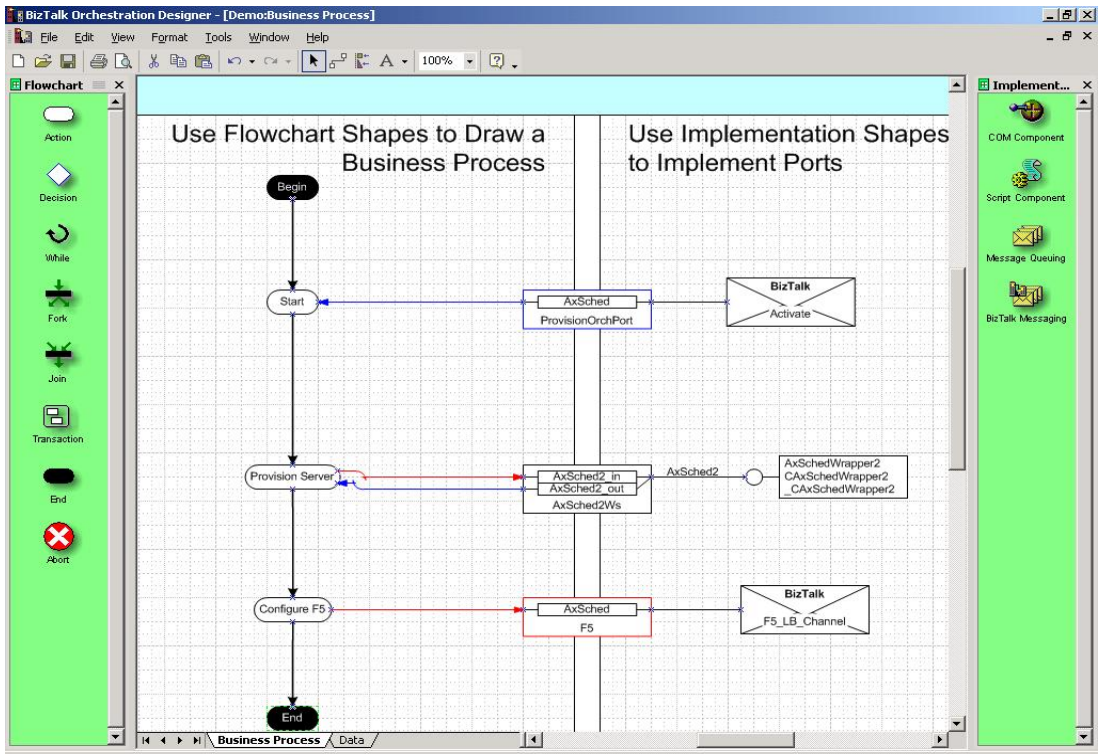
```
<PoolName>AdaptiveEnterprise</PoolName>
<IpAddress>11.11.11.25</IpAddress>
<Port>80</Port>
```

Orchestration Schedules for Automated Provisioning

- BizTalk control
  - The message is submitted to a Message Queue via the MSMQDrop Web Service
  - Message Queue Receive Function is configured and this picks up the document and submits it to BizTalk Messaging
  - Within BizTalk Messaging, the message enters through a Channel
  - Next, the Channel passes the document after some initial processing to a Messaging Port
  - The Messaging Port forwards the document to BizTalk Orchestration.

Orchestration Schedules for Automated Provisioning

- BizTalk Orchestration
- For details see orchestration schedules for automated provisioning document in toolkit



MSMQ Drop Web Service

- A message queuing web service in which a single transactionally-aware drop off point (message queue) can be used as the entry point to kick off an asynchronous business process
- A simple Web Service that accepts a data string and a data label and places the input data string into a specific Message queue, applying to it the input data label as a message label

MSMQ Drop Web Service

- Process
  - Threshold exceeded, Utilization monitor sends XML data imbedded in a SOAP message to the MSMQ Drop Web Service
- MSMQ Drop Web Service places the data in a MSMQ message queue
- BizTalk is configured with message queue receive function to pick up data from the queue
- BizTalk Process starts

Perfmon Web Service

- Windows Performance Monitor provides a useful interface for extracting real-time data on the performance of Windows applications and of the Windows operating system itself
- Limitation:
  - Data collection is limited to its own interface so sharing this data with other applications is difficult
- Perfmon web service addresses this limitation using assemblies in the .NET Framework
  - System.Diagnostics
  - System.Web.Services.WebService
  - Using these assemblies allows performance data to be shared with other applications

ProLiant Essentials RDP Adapter for Automated Provisioning

- The HP ProLiant Essentials Rapid Deployment Pack (RDP) provides a collection of tools that help system administrators to provision and manage server systems
- In order to automate the provisioning of servers in response to the way that a server environment is used, one must monitor that environment and then set up a link between the environment monitor and the tool – i.e. RDP – that provisions the servers

ProLiant Essentials RDP Adapter for Automated Provisioning

- The RDP adapter described in this document consists of two pieces
- The first is a Microsoft .NET Web Service that implements a single namespace, axSched2, and a single class, axSched2ServiceClass
- The second application is a COM+ application that is used as a plug-in for BizTalk Server 2002 Orchestration

Load Balancing Adapters for Automated Provisioning

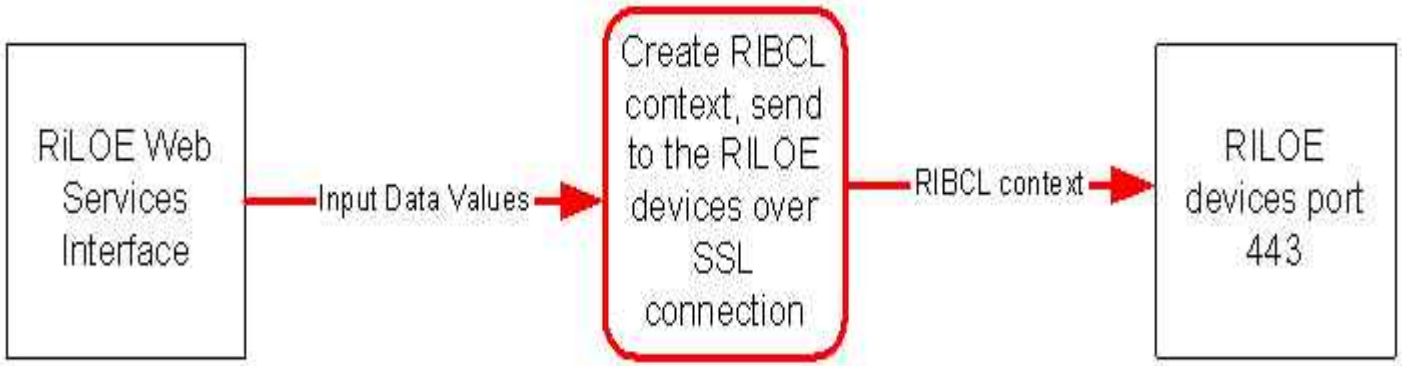
- F5 iControl and hp automated provisioning
- Four pieces
  - Building a BizTalk adapter skeleton
  - Using parameters from the input XML data
  - Invoking F5 iControl web service
    - AddNodeToPool
    - DeleteNodeFromPool
  - Working with SSL trust issues

RiLOE .NET Web Service

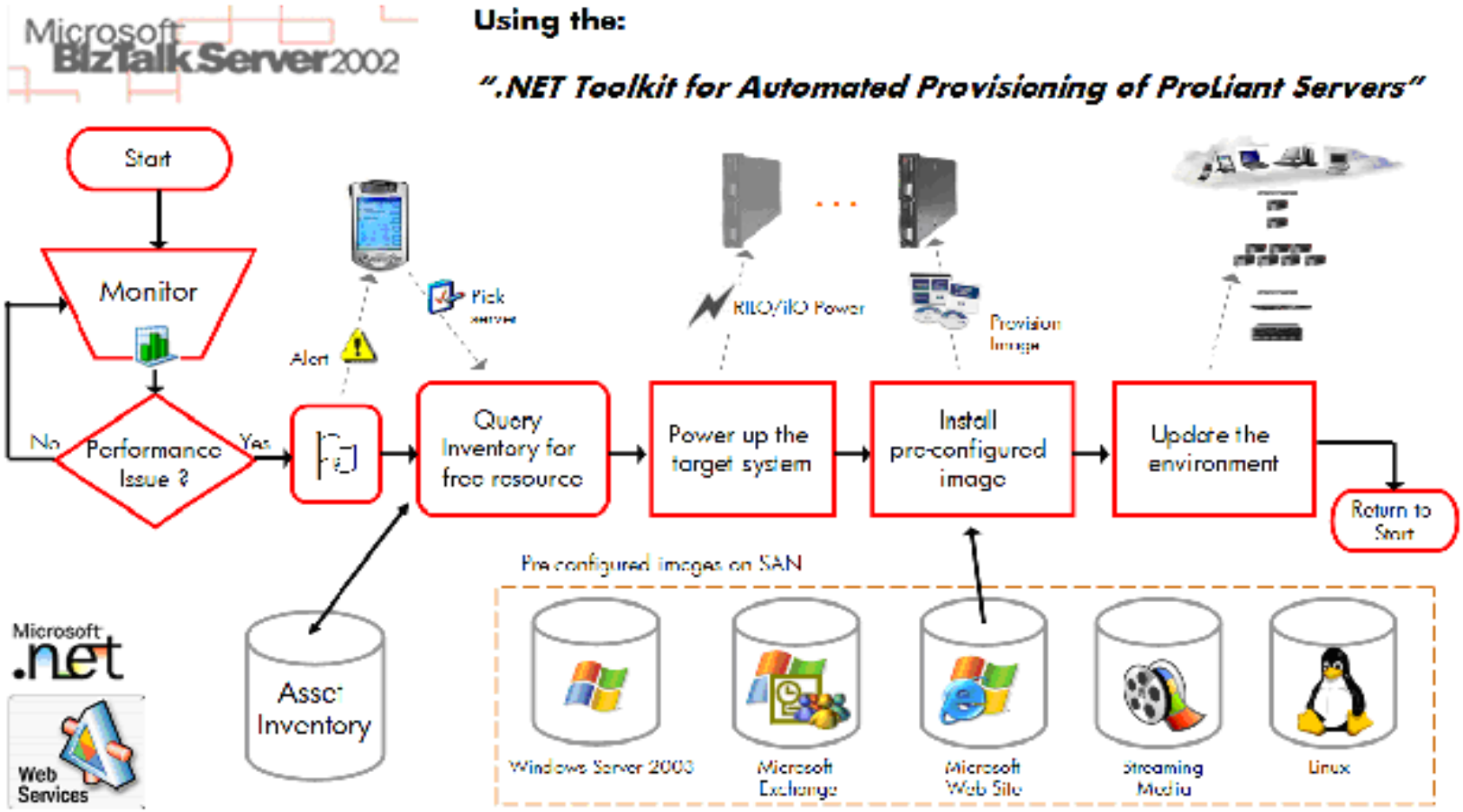
- Native RiLOE tools (cpqlocfg.exe) uses port 443, any application needing different port will face problems
- Cpqlocfg.exe not easy to integrate into other applications
- RiLOE .NET web service addresses these limitations
- RiLOE web service allows functionality using standards like SOAP
- Allows integration into many applications like legacy, HTTP/HTTPS, and management tools like HP Openview

RiLOE .NET Web Service

Web service data flow



Summary


Microsoft BizTalk Server 2002
Using the:
".NET Toolkit for Automated Provisioning of ProLiant Servers"
Start
Monitor
Performance Issue ?
No
Yes
Alert
Pick
RILO/iLO Power
Provision Image
Query Inventory for free resource
Power up the target system
Install pre-configured image
Update the environment
Return to Start
Pre-configured Images on SAN
Windows Server 2003
Microsoft Exchange
Microsoft Web Site
Streaming Media
Linux
Assc Inventory
Microsoft .net
Web Services

Additional resources

- **Toolkit for Automated Provisioning of HP ProLiant Servers using Microsoft .NET**
  - http://activeanswers.compaq.com/ActiveAnswers/Render/1,1027,6210-6-100-225-1,00.htm
- For hands on attend HP World 2003 workshop 1282

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