Cisco Unified Computing System (UCS)

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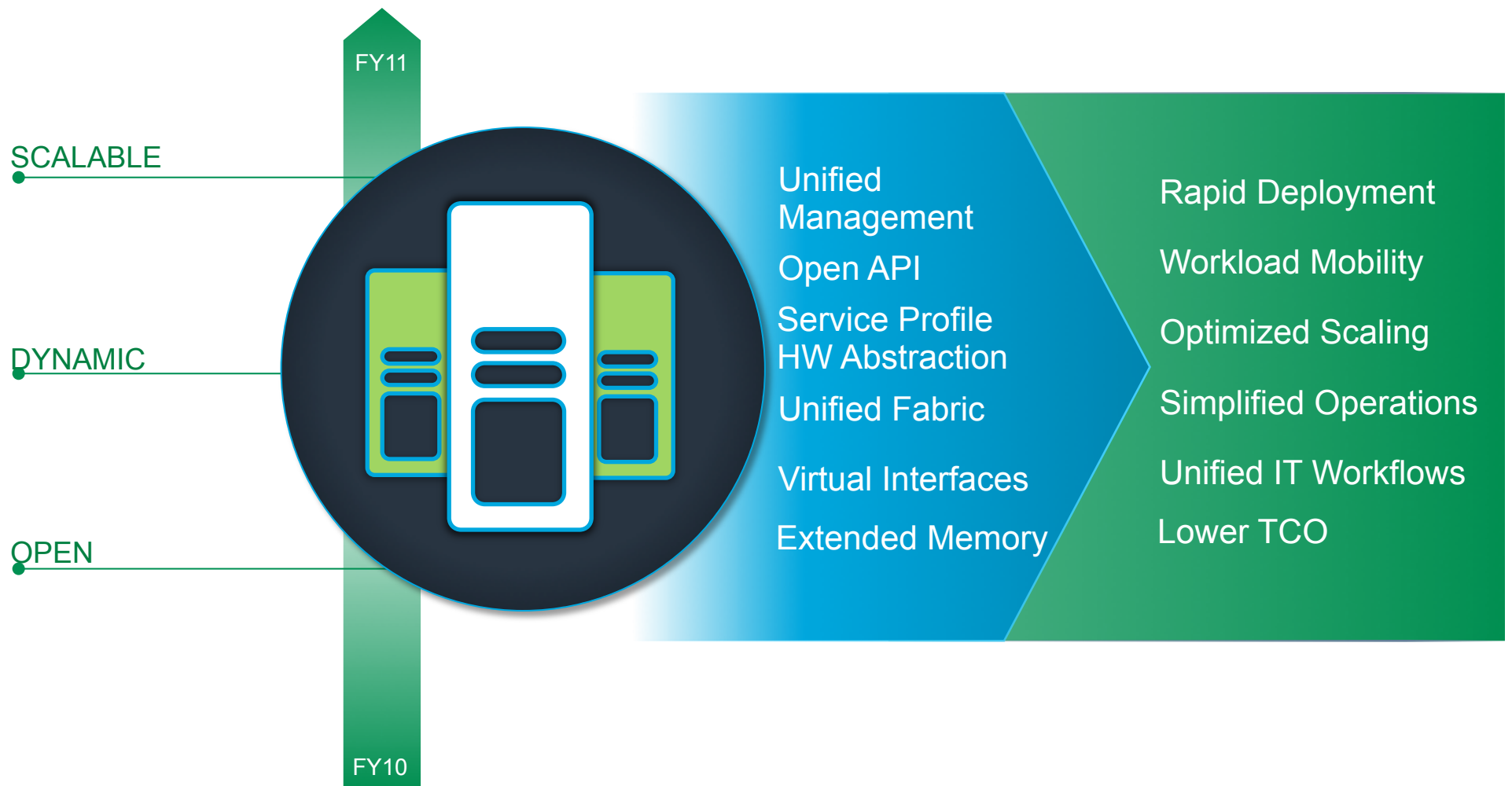
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UCS Architecture and Innovations

Cisco Unified Computing

FY11

FY10

SCALABLE

DYNAMIC

OPEN

Unified Management

Open API

Service Profile HW Abstraction

Unified Fabric

Virtual Interfaces

Extended Memory

Rapid Deployment

Workload Mobility

Optimized Scaling

Simplified Operations

Unified IT Workflows

Lower TCO

Building Blocks of Cisco's UCS
Optimized and Designed as a Integrated System

UCS Manager
Service Profiles
Embedded management

UCS Fabric Interconnect
10GE unified fabric switch
20 or 40 port

UCS Fabric Extender
Remote line card

UCS Blade Server Chassis
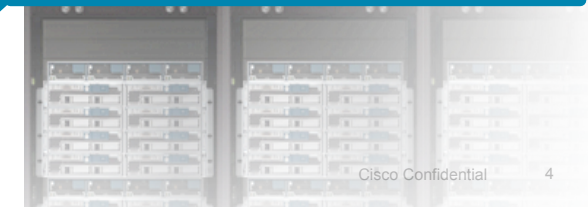Flexible bay configurations

UCS Blade and Rack Servers
x86 industry standard
Patented extended memory

UCS I/O Adapters
Choice of multiple adapters

Virtualization awareness

Unified Computing Platform
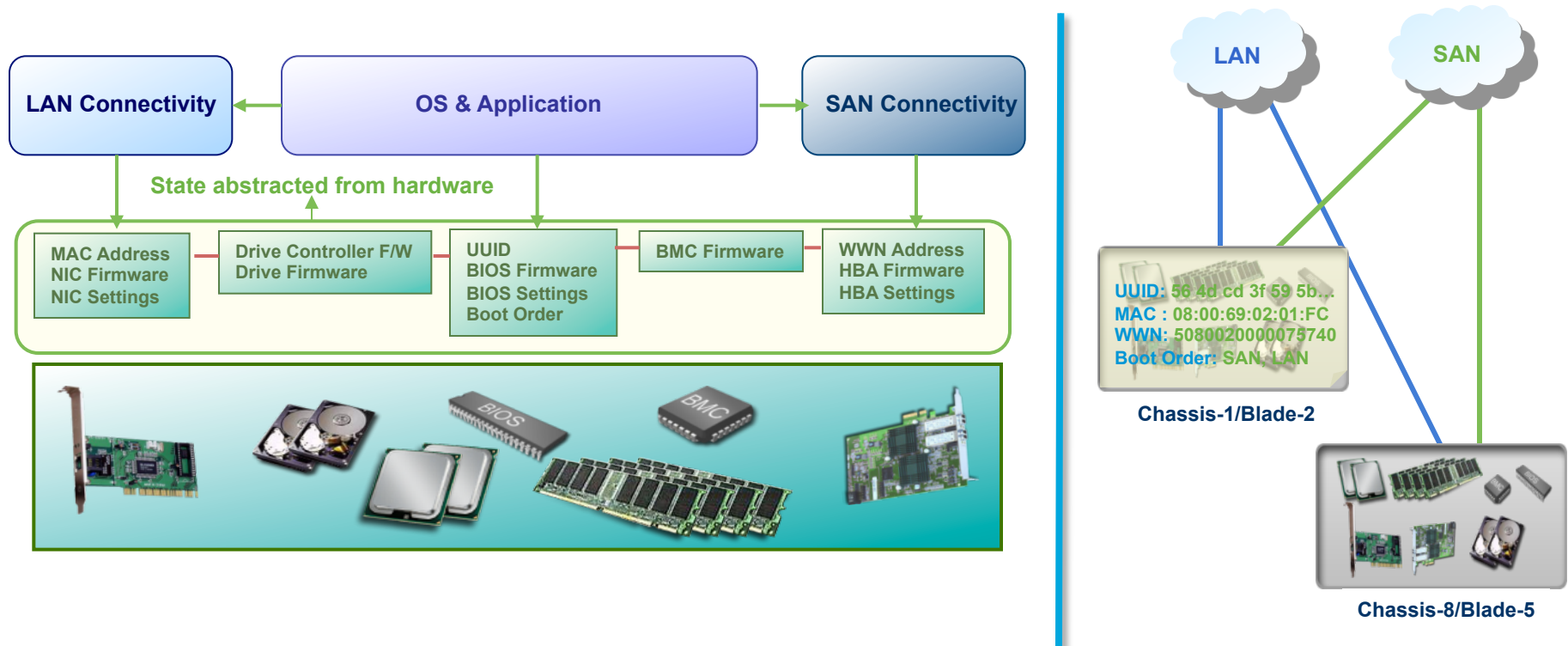
Single Point of Embedded Management

Unified Fabric

Expanded Memory

Virtualized Adapters

Stateless Servers

Innovation: Service Profiles
Hardware State Abstraction Concept

- Separate firmware, addresses, and parameter settings from server hardware

- Make physical servers into interchangeable hardware resources

- Move OS & applications easily across server hardware

Innovation: Service Profiles
Service Profiles: Heart of Stateless

Server Name
UUID, MAC,WWN
Boot info
firmware
LAN, SAN Config
Firmware…

Run-time association
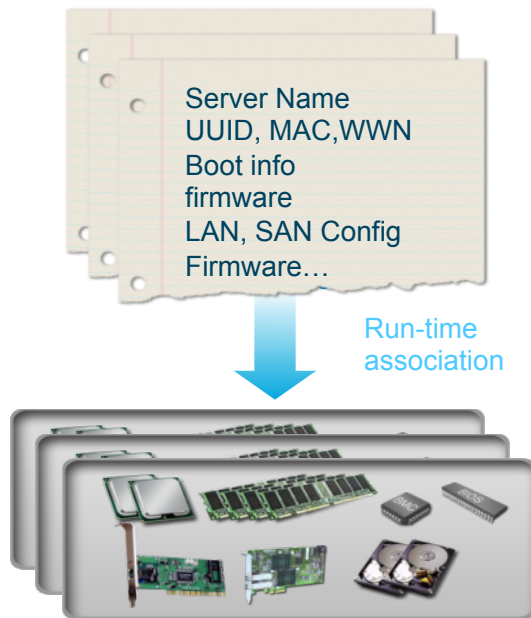
- Contain server state information
    - MAC & WWN addresses for NICs & HBAs
    - Boot order and BIOS parameter settings
    - Firmware bundle for the various hardware components

- User-defined
    - Each profile can be individually created
    - Profiles can be generated from a template

- Applied to anonymous physical (nonhomogeneous) blades at run time

- Consistent and simplified server deployment – "pay-as-you-grow" deployment

- Simplified server upgrades – minimize risk

- Dynamic server provisioning – reduce purchases by time-sharing servers

- Enhanced server availability – purchase fewer servers for HA

UCS Management

Innovation: Embedded Management

Innovating with UCS Manager

Tightly Coupled Partner Management Tools

Existing Customer Management Tools

XML API

Traditional APIs

- **Unified Management Domain**
  - Automatic Discovery
  - Dynamic Provisioning
- **Reduced Points of Management**
- **Building Blocks of Resources for Rapid Provisioning**
- **Simplify Infrastructure Management for Datacenters**
- **No Added Costs**

Service Profile: HR-App1
Network: HR-VLAN
Network QoS: High
MAC: 08:00:69:02:01:FC
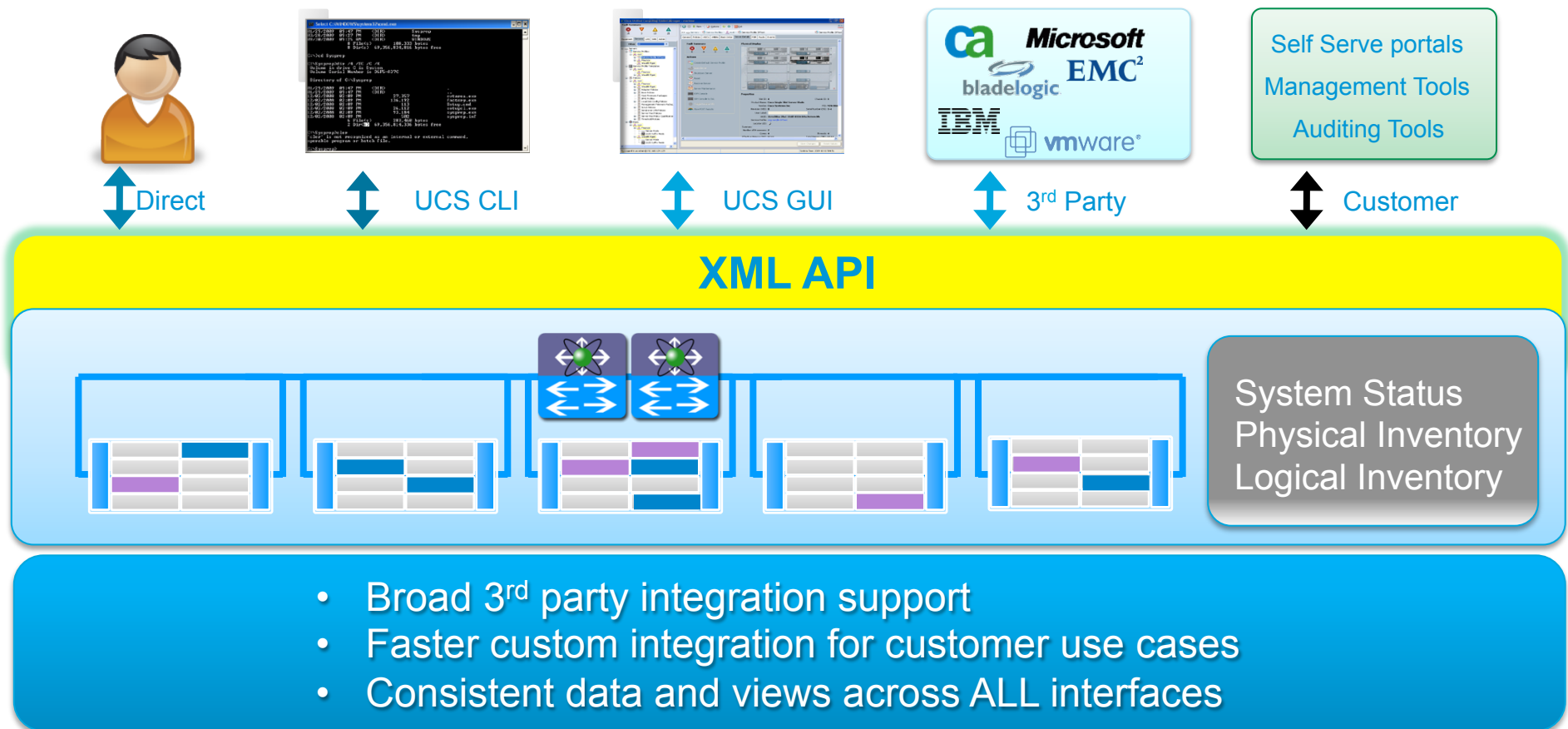WWN:
20:65:32:25:B5:00:A4:28
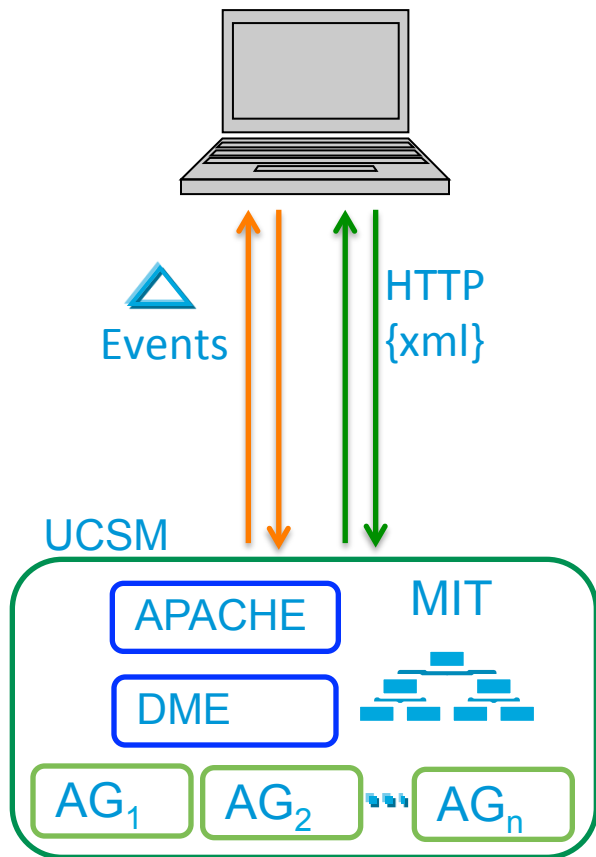BIOS: Version 1.03
Boot Order: SAN, LAN

Single-click configuration of LAN, SAN and firmware parameters

Programmatic Infrastructure

- Comprehensive XML API, standards-based interfaces
- Bi-Directional access to physical & logical internals

| Direct | UCS CLI | UCS GUI | 3rd Party | Customer |

Self Serve portals
Management Tools
Auditing Tools

XML API

System Status
Physical Inventory
Logical Inventory

- Broad 3rd party integration support
- Faster custom integration for customer use cases
- Consistent data and views across ALL interfaces

Cisco UCS XML Interface

Events

HTTP {xml}

UCSM

APACHE

DME

MIT

AG$_1$ AG$_2$ ... AG$_n$

Embedded apache webserver

XML content sent in body of http post

Result contained within body of http response

URL:
http://<Virtual IP of UCS Manager>

Clients invoke methods to query and configure the server

Method categories: instance, class, generic

http (port 80) and https (port 443)

GUI uses the same API – look at logs in:
C:\Documents and Settings\{user}\Application Data\Sun\Java\Deployment\log\.ucsm

UCS API Overview

UCS API Features

- **Communicates over HTTP/HTTPS**
- **XML Based, Transactional**
- **Standard Request/Response cycle**
- **Role Based Authentication**
- **Object Model Hierarchy**
- **Built-in Object Browser**
- **Published Schema**
- **Java Doc Style documentation**
- **High Availability**
- **EventStream**
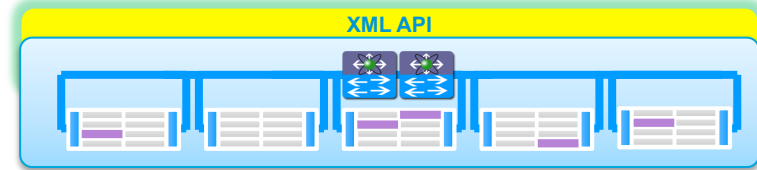
XML API

Use case examples for the UCS XML API

Manage Multiple UCS Systems

- Overarching system to maintain resource pools, users, policies, etc…

Monitor and Integrate the Event Stream

- Capture events, parse, store, report
- Create event gateway to monitoring solutions

Automate Issue Remediation

- Generate appropriate responses to events

Configuration Backup

- Export entire UCS Information Model

Firmware Image Management

- Ensure Firmware consistency across all components

Cisco Developer Network

Free!

Web based developer community
http://developer.cisco.com/web/unifiedcomputing/home

- **Downloads:**
  - UCS Platform Emulator
  - goUCS Automation Tool
  - XML API, Perl, Powershell code samples (44 and counting)

- **Documentation:**
  - Programming & developer guides
  - White papers
  - Reference guides (XML model, Faults)

- **Collaboration:**
  - Blogs
  - Peer to peer forums
  - Videos
  - Access to Cisco subject matter experts

UCS Platform Emulator

- Full featured emulator for the UCS Manager

- Installs as a Virtual Machine

- Provides complete support for all XML API calls

- Object Browser to peruse the UCSM model

- Import & replicate existing live UCS Manager physical inventory

- Share saved physical inventories among UCS PEs

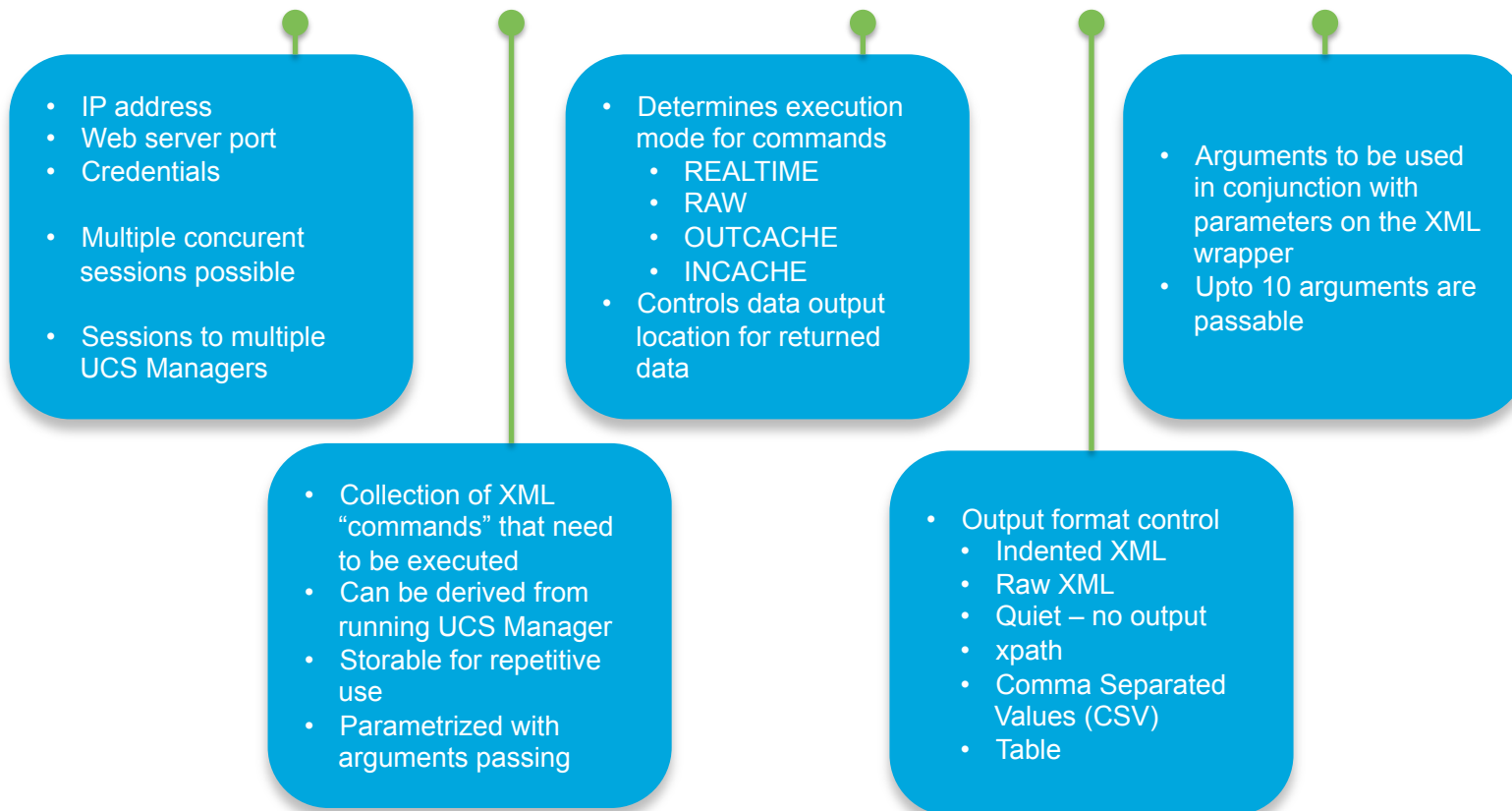- Drag-n-drop hardware builder to create custom physical inventory
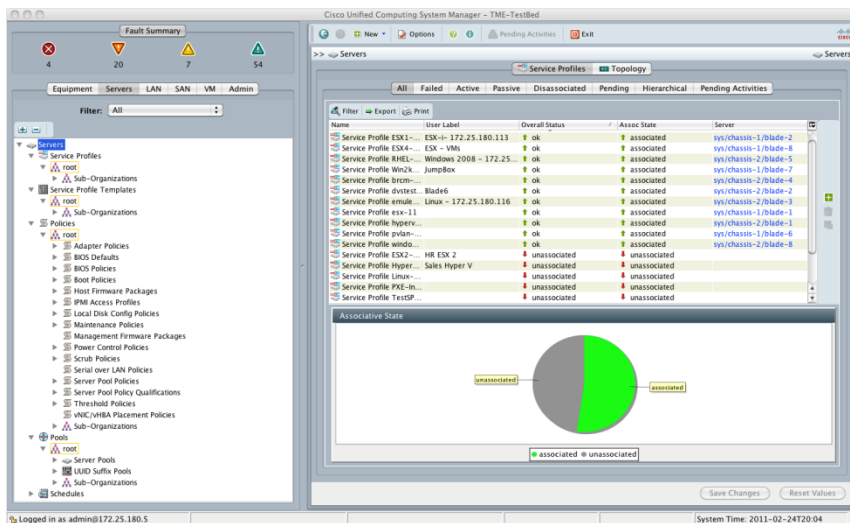
goUCS framework

A simple way to capture and replay XML on UCS
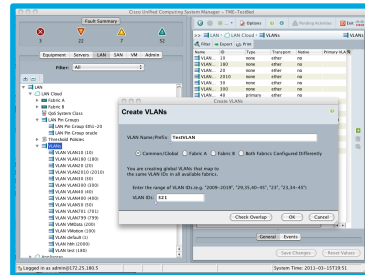
goUCS invocation syntax:

`X:\goucs <session> <xml/cmd wrapper> <process type> <output type> <user args>`

- IP address
- Web server port
- Credentials

- Multiple concurrent sessions possible

- Sessions to multiple UCS Managers

- Determines execution mode for commands
  - REALTIME
  - RAW
  - OUTCACHE
  - INCACHE
- Controls data output location for returned data

- Arguments to be used in conjunction with parameters on the XML wrapper
- Upto 10 arguments are passable

- Collection of XML "commands" that need to be executed
- Can be derived from running UCS Manager
- Storable for repetitive use
- Parametrized with arguments passing

- Output format control
  - Indented XML
  - Raw XML
  - Quiet – no output
  - xpath
  - Comma Separated Values (CSV)
  - Table

goUCS Automation Tool

An Example: Automating VLAN creation

1 **Capture**

Perform the task in UCS Manager
Use goUCS filterlog to capture the transaction

2 **Create**

```
X:\>mkdir X:\goucs\cmdwrappers\CreateNewVlan
```

Create the XMLwrapper using the captured logs
Create variables for parameters

```
User Arguments
UserArg1=%inUserArg1%
UserArg2=%inUserArg2%
UserArg3=
...
UserArg10=
```

3 **Execute**

```
X:\>goucs createvlan realtime indent TestVLAN 321
```

Run the command on one or more UCS systems substituting values for variables

Available now on Cisco Developer Network: http://developer.cisco.com/web/unifiedcomputing/goucs