Automation Tools for UCS Sysadmins
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What is the Cisco UCS XML API?
Cisco Unified Computing System
Optimized and Designed as an Integrated System

**Cisco UCS™ Manager**
*(Read / Write Configuration Interfaces)*
UCS Manager GUI and CLI

**Cisco UCS Fabric Interconnects**
*(Read Only / Cut Through Interfaces)*
SNMP, Syslog, SMTP, SMASH CLP, CIM XML, Smart Call Home

**Cisco UCS I/O modules**

**Cisco UCS Blade Server Chassis**

**Cisco UCS Blade and Rack Servers**
*(Cut through Interfaces to CIMC)*
Serial over LAN, KVM, IPMI

**Cisco UCS I/O Adapters**
Programmatic Infrastructure

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

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

Everything is an object

Objects are hierarchically organized

Class identifies object type
Card, Port, VNIC…

Class Inheritance
Server port is a subclass of port.
A server blade is a subclass of compute entity.

Set of attributes
- identity
- states
- descriptions
- references
- lifecycle

UCS XML Database contains comprehensive system information
- Discovered components
- System configuration
- Operational status including statistics and faults
What toolkits are available for Cisco UCS automation development?
Cisco Developer Network

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

- Downloads:
  - UCS Platform Emulator (UCSPE)
  - goUCS Automation Tool
  - XML API, Perl, PowerShell code samples (44 and counting)
  - Microsoft – PowerShell library, SCOM MP
  - HP Software – HPOM, HPOO integration modules

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

- Collaboration:
  - Blogs
  - Peer to peer forums
  - Videos
  - Access to Cisco subject matter experts
goUCS Automation Toolkit
goUCS Automation Toolkit

- **UCS Manager**: Know XML, no problem
- **With goUCS**: No XML, no problem
- **Convert UCS Manager** actions into automation scripts

1. Perform single action on UCS Manager and capture it
2. Create script in goUCS framework with variable substitutions
3. Re-run script over and over against single or multiple UCSMs

**What's new with goUCS v2.0**
- Linux & Mac OS X Support
- HTTPS Communication Support
- Tagged Based User Arguments
- Performance Enhancements
goUCS Automation Toolkit

Invocation Syntax

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

- Collection of XML “functions” available to be executed
- Can be derived from running UCS Manager
- Storable for repetitive use
- Parameterized with arguments passing

- 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
  - Up to 10 arguments are passable
  - More than 10 arguments can be passed answer files

- Output format control
  - Indented XML
  - Raw XML
  - Quiet – no output
  - xPath
  - Comma Separated Values (CSV)
  - Table
**goUCS Automation Toolkit**

**Example:** Automating VLAN Creation

1. **Capture**
   - Perform the task in UCS Manager
   - Use goUCS filterlog to capture the transaction

2. **Create**
   - `mkdir <GOUCS_PATH>/xmlwrappers/CreateVlan`
   - `goucs filterlog trueco vlan10 vlan10:NAME @id:10:ID > CreateVlan.xml`
   - Create the XML wrapper using the captured logs
   - Create variables for parameters

3. **Execute**
   - `goucs createvlan realtime indent /name:TestVLAN /id:321`
   - Run the command on one or more UCS systems substituting values for variables

Cisco UCS PowerTool
Bringing More Power to PowerShell

The Essential Tool Kit

- PowerShell is the common management platform used across all Microsoft operating systems and applications
- UCS PowerTool is a Cisco-built, user-friendly, PowerShell-based library that Microsoft tools understand
- A simple way to utilize Windows PowerShell and customize tools to business needs

Don’t reinvent the wheel…
...build on it
Cisco UCS PowerTool
Key Supported Objects and Assets

- **Service Profiles**
  - Policies (Firmware, Boot Order, vNIC / vHBA config, Storage, IPMI, SoL, BIOS)
  - Pools (WWN, UUID, MAC)
  - Configuration Faults
  - Launch UCS KVM for SP

- **Chassis**
  - Hardware – Power Supply / Fan Modules / IO Modules
  - Power / cooling / network / environmental statistical data
  - Config and Hardware Faults

- **Servers**
  - Hardware - CPU, Memory, Adaptors, CIMC)
  - Power Operations
  - Power / cooling / network / environmental statistical data
  - Hardware Faults

- **Fabric Interconnect**
  - Hardware – Power Supply / Fan Modules / Network Expansion Modules
  - Power / cooling / network/ environmental statistical data
  - Network Elements (VLAN, VSAN, QoS, Port Profiles)
  - Config and Hardware Faults

- **Configuration Operations**
  - Pools (WWN, UUID, MAC, IP)
  - Policy creation, manipulation, deletion, and consumption
  - vNIC / vHBA Templates
  - Service profile template creation, cloning, deletion, and consumption
    - Simplistic service profile creation (with a limited scope of what is available to configure)
    - Expert SP creation (use variabilized XML w/ config file)
  - Compare Managed Objects across orgs and/or domains
  - Sync Managed Objects across orgs and/or domains
Q & A