Cisco UCS mint cloud platform

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T-Systems Symposium 2012

Cloud computing

- Wikipedia, 2012. nov. 14.

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet).

…

End users access cloud-based applications through a web browser or a light-weight desktop or mobile app while the business software and user's data are stored on servers at a remote location.
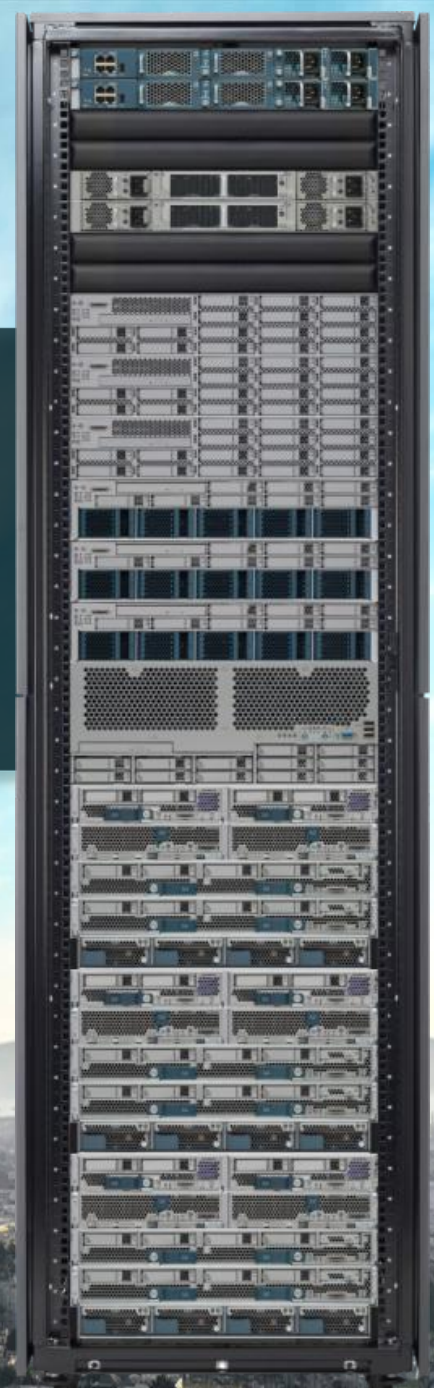
…

Proponents claim that cloud computing allows enterprises to get their applications up and running faster, with improved manageability and less maintenance, and **enables IT to more rapidly adjust resources** to meet fluctuating and unpredictable business demand.

What Sets Cisco Unified Computing Apart…
… and how does that impact OpEx

1. **Single Logical Blade Chassis**

   versus mini racks

2. **Cisco FEX-Link architecture**

   versus lots-of-little-switches

3. **Stateless Server Provisioning**

   Service Profiles

4. **Open API for management**

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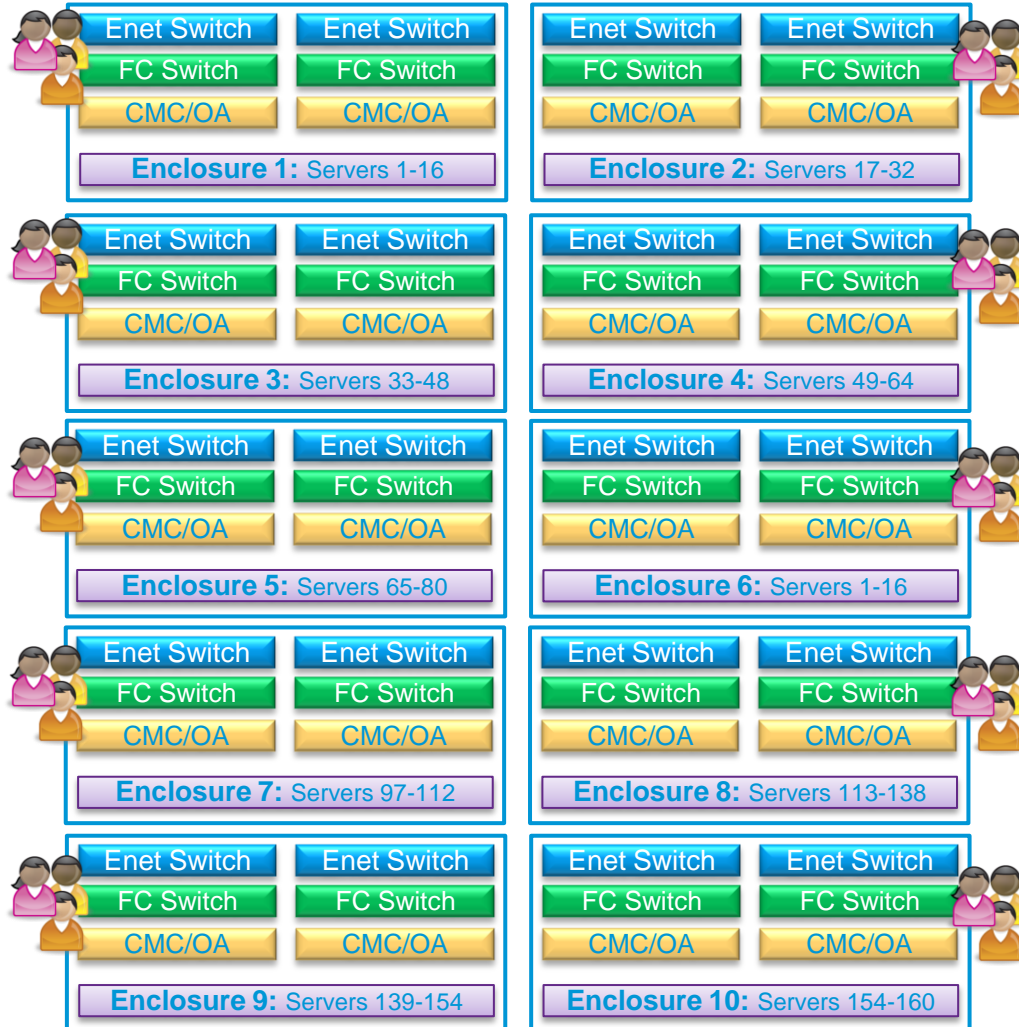
Service Profiles
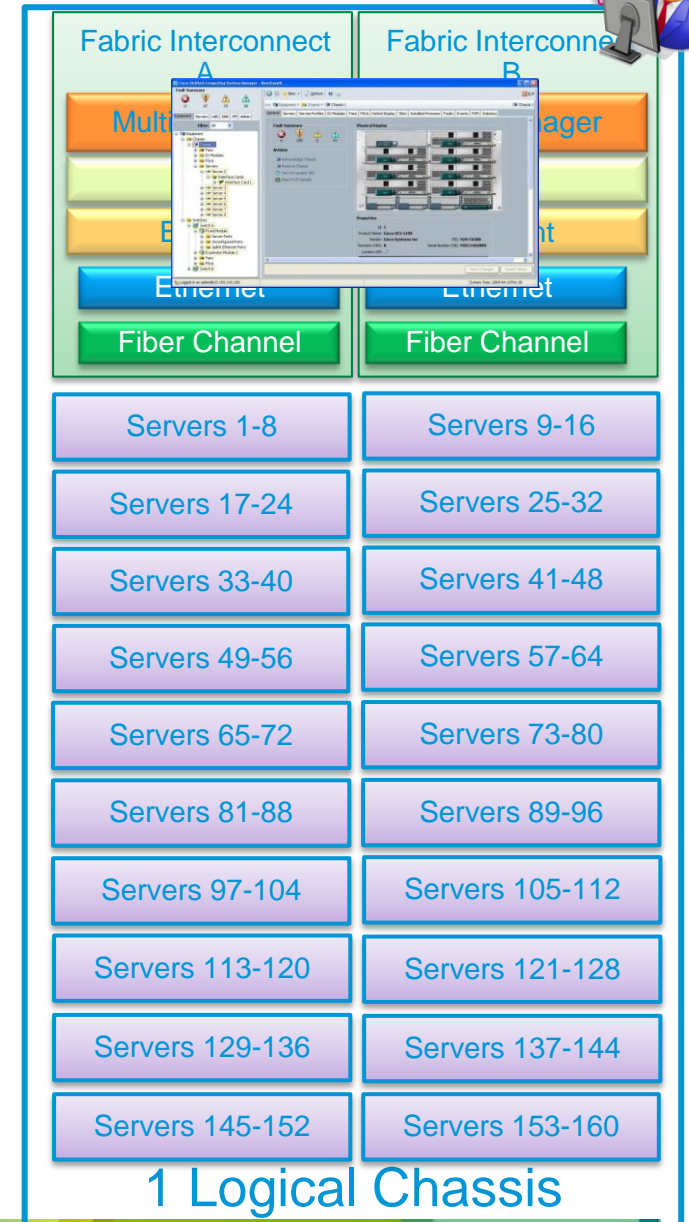
4. Open API for management

Legacy Blade Architecture

Cisco UCS

Multi-Chassis Server Identity Manager

Server Health Monitoring

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 1: Servers 1-16

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 2: Servers 17-32

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 3: Servers 33-48

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 4: Servers 49-64

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 5: Servers 65-80

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 6: Servers 1-16

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 7: Servers 97-112

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 8: Servers 113-138

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 9: Servers 139-154

Enet Switch	Enet Switch
FC Switch	FC Switch
CMC/OA	CMC/OA

Enclosure 10: Servers 154-160

Fabric Interconnect A	Fabric Interconnect B
Ethernet	Ethernet
Fiber Channel	Fiber Channel

Servers 1-8	Servers 9-16
Servers 17-24	Servers 25-32
Servers 33-40	Servers 41-48
Servers 49-56	Servers 57-64
Servers 65-72	Servers 73-80
Servers 81-88	Servers 89-96
Servers 97-104	Servers 105-112
Servers 113-120	Servers 121-128
Servers 129-136	Servers 137-144
Servers 145-152	Servers 153-160

1 Logical Chassis
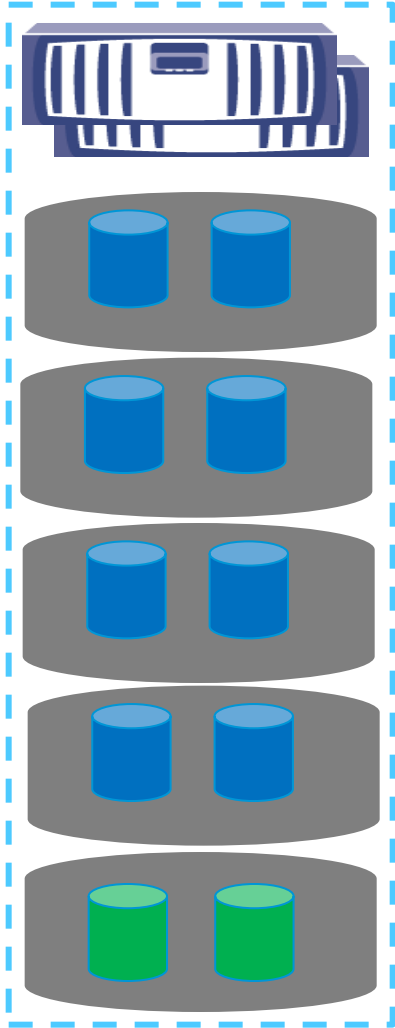
Similar Concept

- Storage Controllers:
  - Manage internal structure
  - Present LUNs to the network
  - Implement intelligence
    - Remote copy
    - Backup
    - De-duplication
    - Thin provisioning

- UCS Fabric Interconnect:
  - Manage internal structure
  - Present Service Profiles to the network
  - Implement intelligence
    - Provisioning
    - Virtualisation optimization
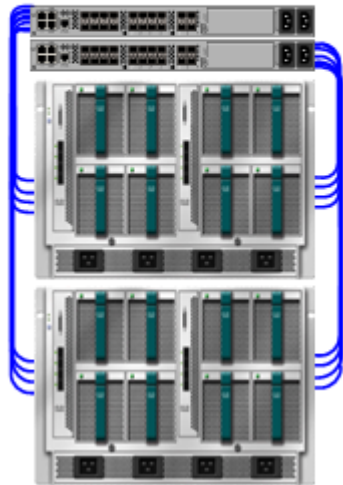   - Firmware management
    - Power capping
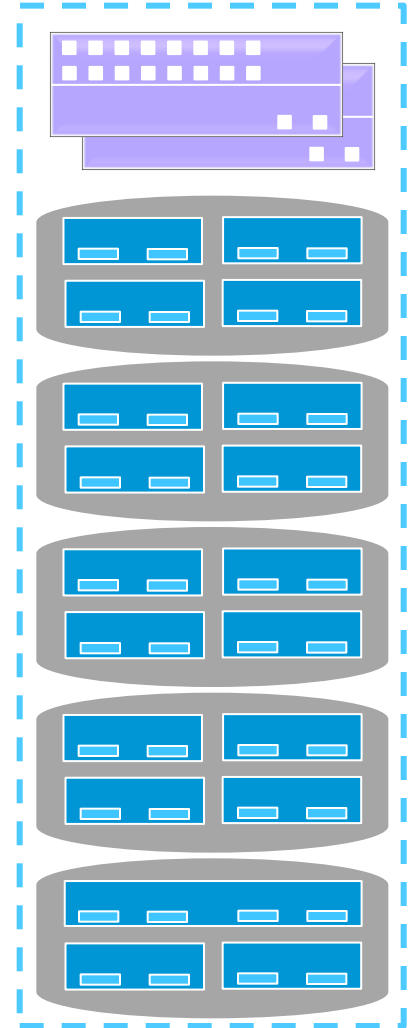
Cisco UCS:
A single, logical, expandable blade server chassis

8 Cisco UCS Blades
1 UCS Manager
3 Management IP Addresses

16 Cisco UCS Blades
1 UCS Manager
3 Management IP Addresses

24 Cisco UCS Blades
1 UCS Manager
3 Management IP Addresses

32 Cisco UCS Blades
1 UCS Manager
3 Management IP Addresses

Add **One** UCS Blade Chassis
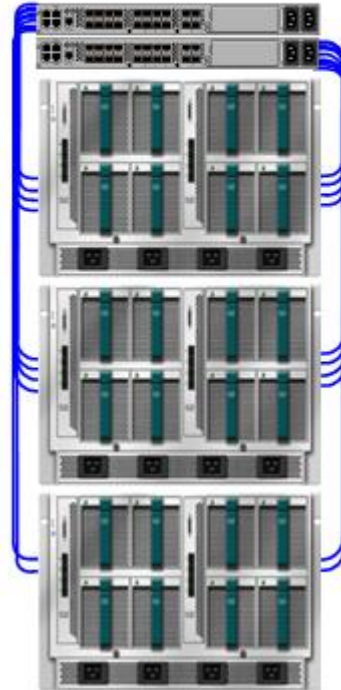
Add **One** UCS Blade Chassis

Add **One** UCS Blade Chassis
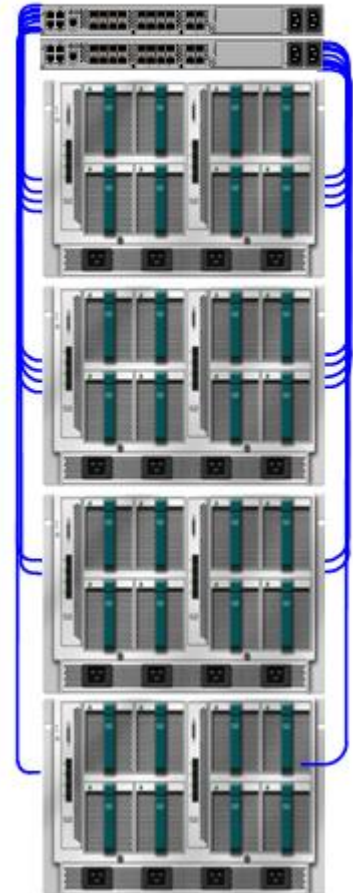
Changing the Game

Unpacked, Racked, Cabled and Powered.

06:48.9
Stop   Lap

Interfaces enabled, discover new chassis & blades

17:33.9
Stop   Lap

Assign Service-Profile to new blade and boot ESXi

25:30.7
Stop   Lap

Video and blog at:
http://www.tbijlsma.com/2011/03/adding-an-extra-ucs-chassis
http://www.tbijlsma.com/2011/04/adding-a-extra-ucs-chassis-the-configuration-minutes

What Sets Cisco Unified Computing Apart…

1. **Single Logical Blade Chassis**

   versus mini racks

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   versus lots-of-little-switches

3. **Stateless Server Provisioning**

   Service Profiles

4. **Open API for management**

Elimating the function of blade switching
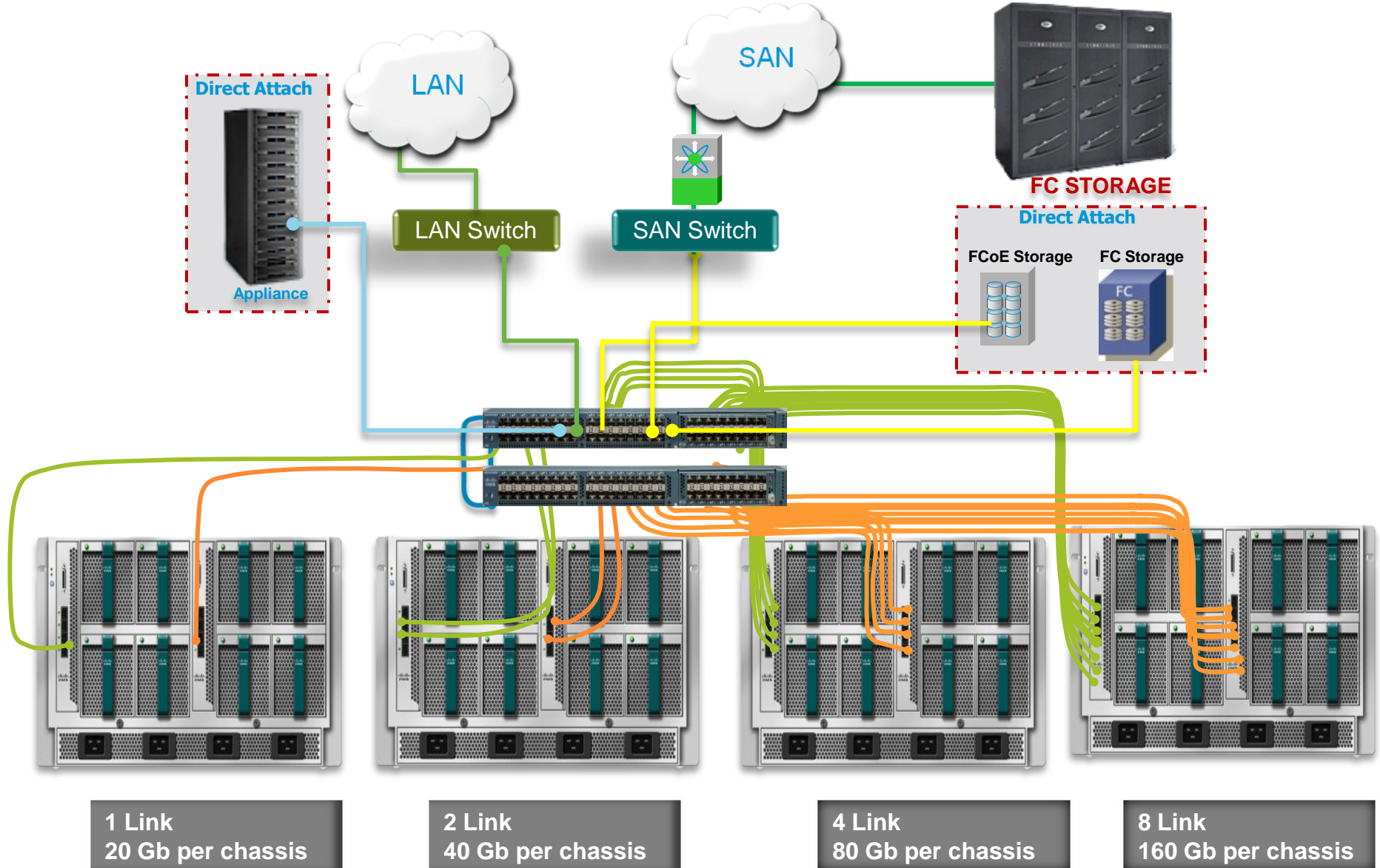
1 Link
20 Gb per chassis

2 Link
40 Gb per chassis

4 Link
80 Gb per chassis

8 Link
160 Gb per chassis

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UCS Service Profiles
Simply a Blueprint

Every house requires a blueprint detailing how to build it

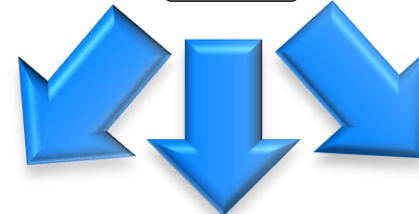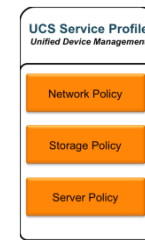To build that house we need a series of inter-working, necessary parts – from plumbing, electricity, light and air, waste, and structure

We can think of servers much the same way....

UCS Service Profiles:
Configuration Portability

Service Profile
Identity for a server

SIM Card
Identity for a phone

Stateless Computing
## Legacy Servers require lots of manual intervention

Server Identity & Personality

NIC MACs
HBA WWNs
Server UUID
VLAN Assignments
VLAN Tagging
FC Fabrics Assignments
FC Boot Parameters
Number of vNICs
Boot order
PXE settings
IPMI Settings
Number of vHBAs
QoS

Call Home
Template Association
Org & Sub Org Assoc.
Server Pool Association
Statistic Thresholds
BIOS scrub actions
Disk scrub actions
BIOS firmware
Adapter firmware
BMC firmware
RAID settings
Advanced NIC settings
Serial over LAN settings
BIOS Settings

SAN

LAN
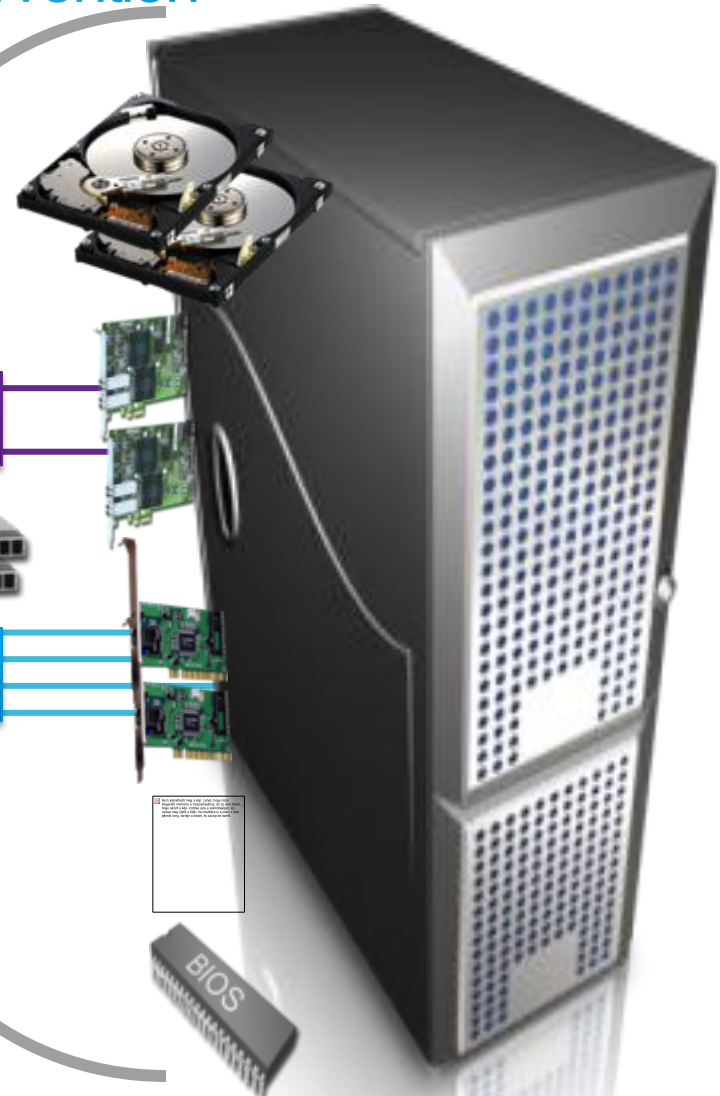
Stateless Computing
UCS Service Profiles reduce complexity and deployment speed

To build our server
…
Make one or more unique profile copies from a template *(i.e. our blueprint)*

Associate a single profile to a single server. Repeat for more servers as needed

Rapidly deploy any number of servers in just a few clicks!

Service Profile 1

Service Profile 2

Service Profile 3

Service Profile *n*

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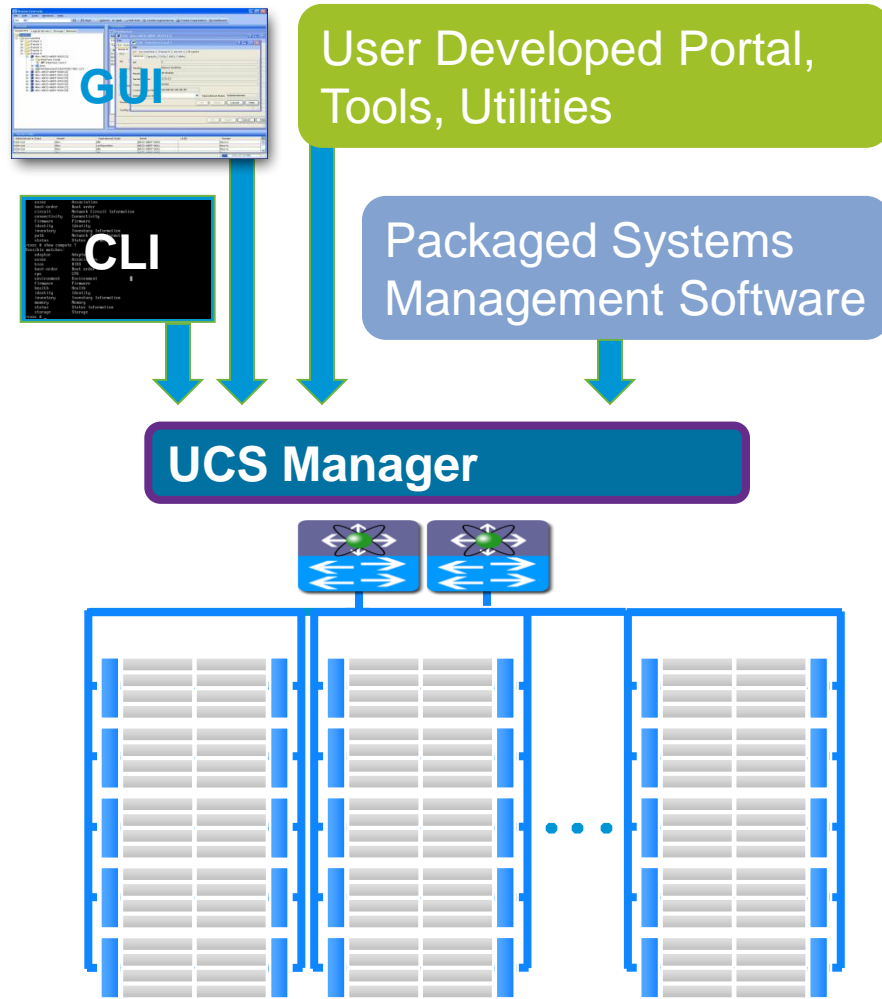**2. Cisco FEX-Link architecture**

      versus lots-of-little-switches

3. Stateless Server Provisioning

      Service Profiles

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UCS Manager

GUI

User Developed Portal, Tools, Utilities

CLI

Packaged Systems Management Software

UCS Manager

- **Embedded device manager**

  Discovery, Inventory, Monitoring, Diagnostics, Statistics Collection, Configuration

- **Unifies many UCS HW components into a single, cohesive, system**

  Adapters, blades, chassis, fabric extenders, fabric interconnects

- **APIs for integration with new and existing data center infrastructure**

  SMASH-CLP, IPMI, SNMP

  XML SDK for commercial & custom implementations

- **Key Feature: Service Profiles**

  Coordinated deployment to managed endpoints

Use Case: Automated vSphere Deployment
Profile-Based Provisioning Integrated with vSphere 5

VMware vSphere 5 Auto Deploy

- Boot servers over IP networks using shared storage

- Link each new physical server to a vCenter boot image

UCS enhanced Auto Deploy

- Link service profile template to a vCenter boot image

- Deploy many vSphere servers with a single click

- Policy enforced: saves time and reduces errors

Without UCS

Associate boot image one server at a time

Server #1

Server #2

Server #3

Server #...

Select a server: go to server element manager, find server, copy MAC address

Find Auto-Deploy image: go to vCenter, select image, enter server MAC address

Boot server

UCS Enhanced Auto Deploy

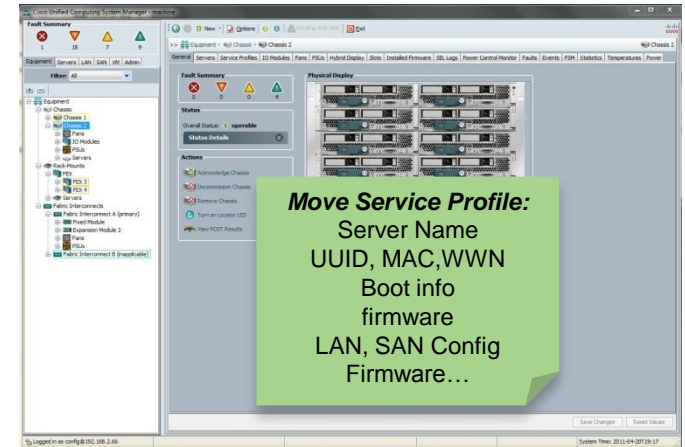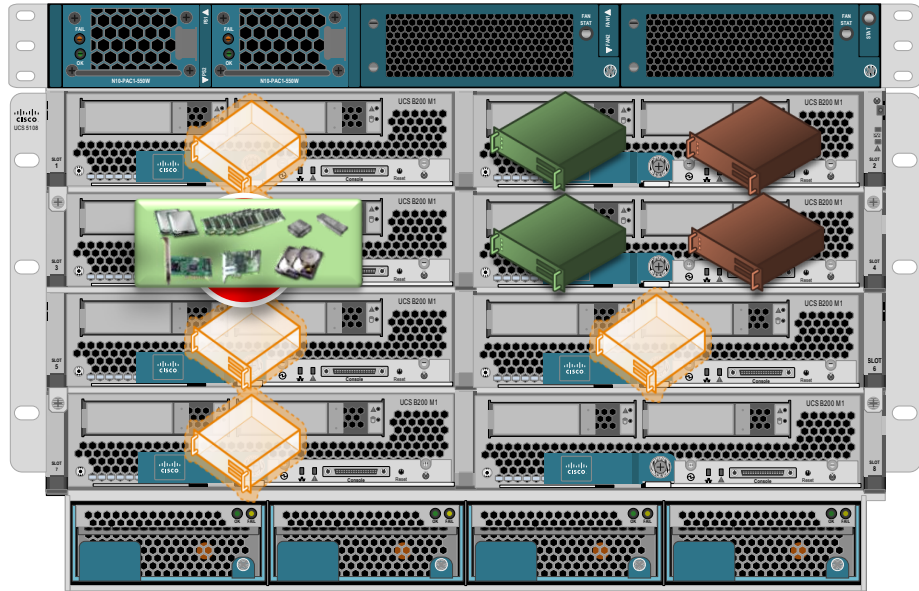Automatically associate boot image

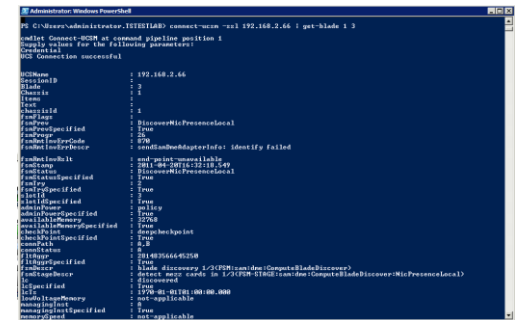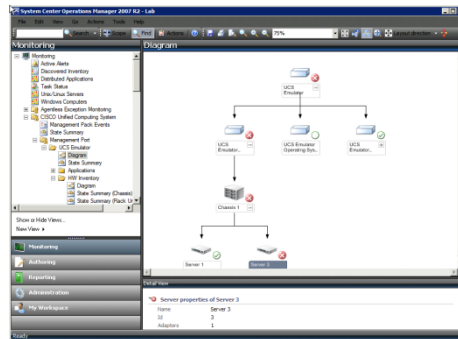**Server #1**

Server #2

Server #3

Server #...

Select template
Deploy new server

Use Case: Service Profile Portability With MS

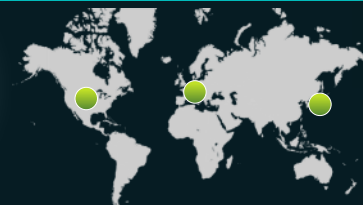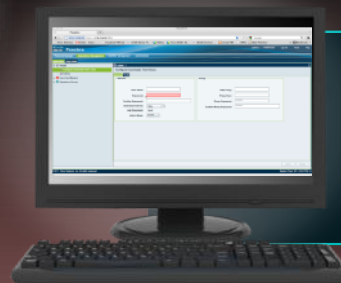SQL Server-Physical

Application Server-VM

Web Server-VM

Move Service Profile:
Server Name
UUID, MAC,WWN
Boot info
firmware
LAN, SAN Config
Firmware…

Unified Management for a Multi UCS Environment

Multi-UCS Manager

Unified Management at Scale

Coming in 2H 2012

Multi-UCS Manager

Data Center 1

UCS Manager   UCS Manager

Data Center 2

UCS Manager   UCS Manager
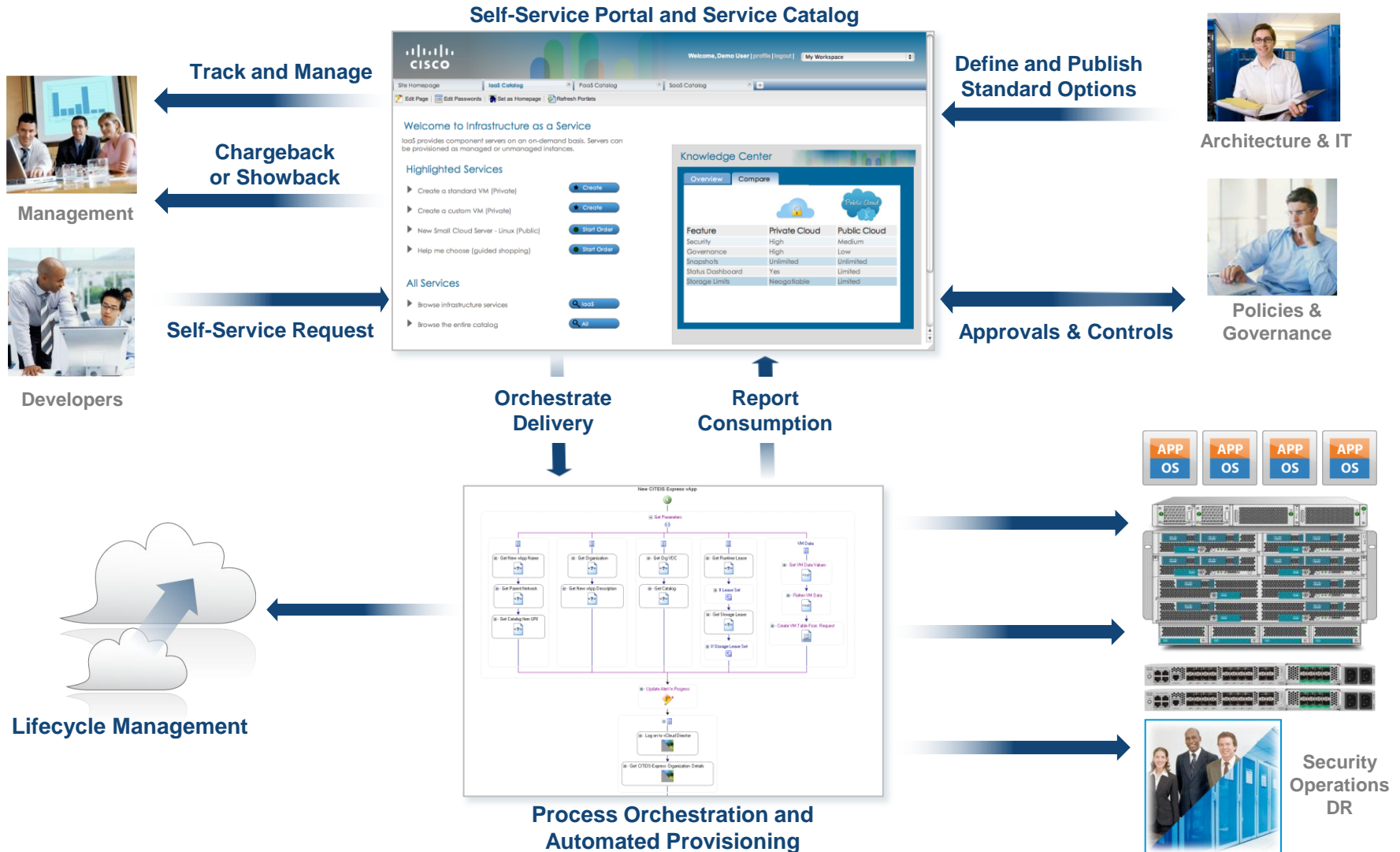
Data Center 3

UCS Manager

- Unifies management of multi UCS domains
- Leverages UCS Manager technology
- Simplify global operations with centralized inventory, faults, logs and server consoles

- Delivers global policies, service profiles, ID pools and templates
  - Foundation for high availability, disaster recovery and workload mobility
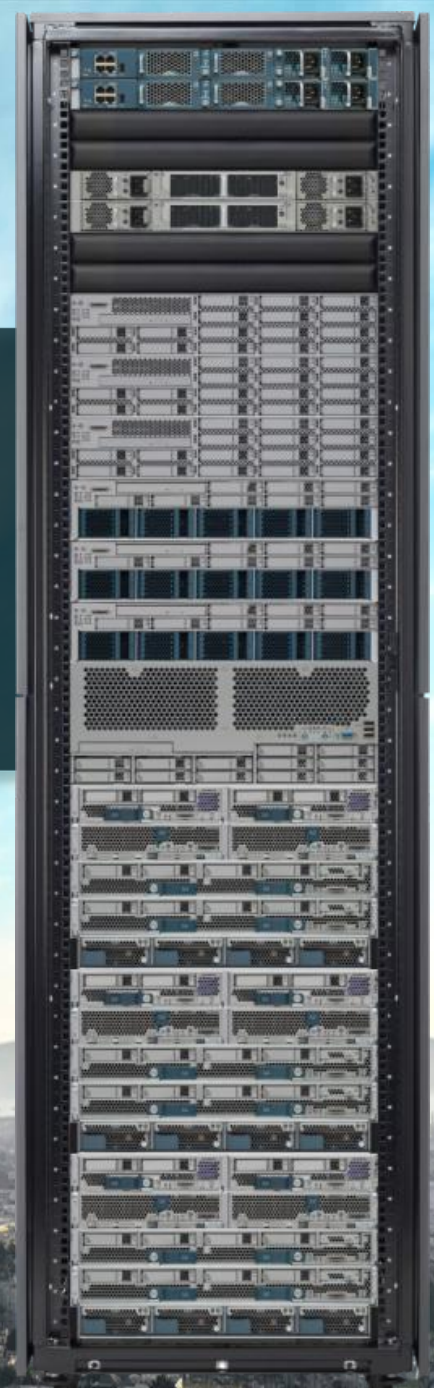- Model based API for large scale automation

This is an upcoming product—Feature set for first release subject to change

Cisco Intelligent Automation for Cloud

Self-Service Portal and Service Catalog

Track and Manage

Chargeback or Showback

Management

Developers

Self-Service Request

Define and Publish Standard Options

Architecture & IT

Approvals & Controls

Policies & Governance

Orchestrate Delivery

Report Consumption

Lifecycle Management

Process Orchestration and Automated Provisioning

Security Operations DR

"Cisco UCS is a Mini Cloud Computing Platform with Automated Provisioning and an Open API"

Thank you.