

TOMORROW starts here.



Cisco *live!*

How to Interconnect with Hybrid Cloud Architectures and Approaches

BRKVIR-2023

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Data Centre Group

Session Details - BRKVIR-2023

Session Title:

Cisco Nexus 1000V InterCloud-based Hybrid Cloud Architectures and Approaches

Abstract:

Customer and Partners are looking for approaches and technologies to securely extend their data centre workloads to public cloud, while maintaining their current operational consistency and paradigms in their current data centres. Service Providers are also looking ways to expand their cloud services and on-board workloads.

This session will review the approach and technical architecture for secure hybrid clouds where enterprises and SPs can extend their network and network virtual services in a secure fashion. The session will be based on details of Cisco Nexus 1000V InterCloud and related technology and feature capability, and how to design into a secure hybrid cloud with enterprise workloads and network services.

The Real Agenda!

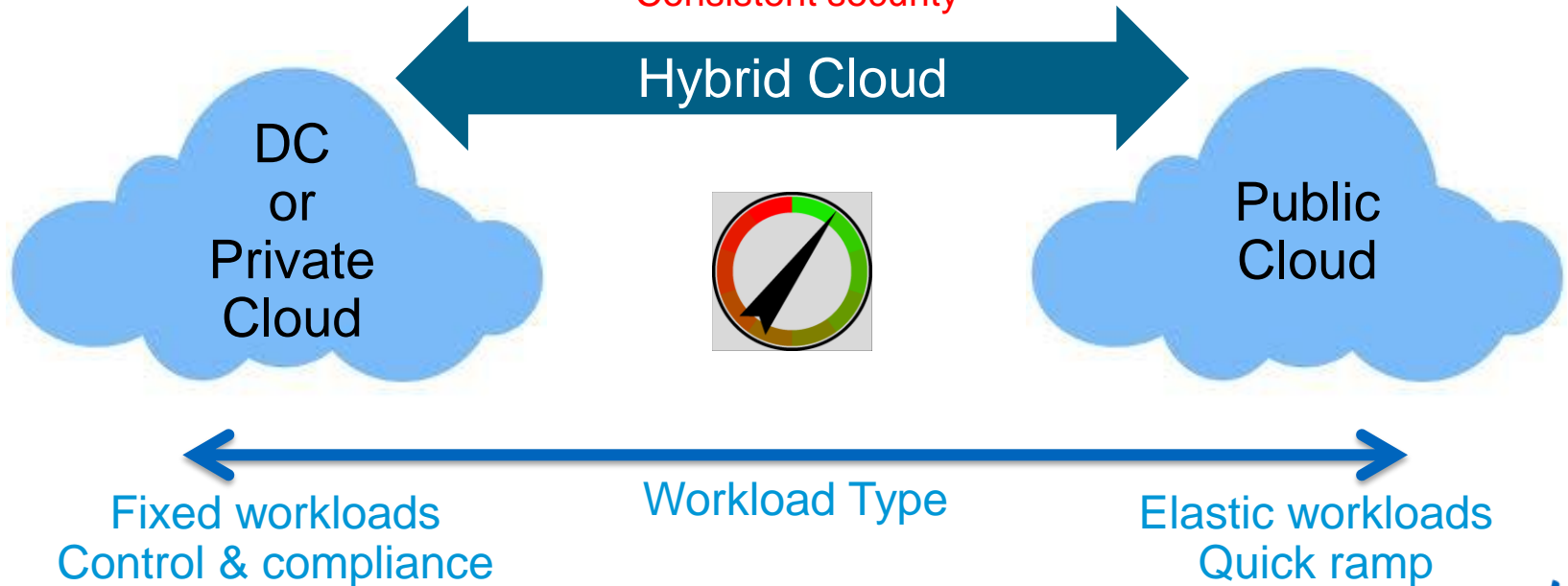
- Private, Public, or Hybrid Cloud?
- Hybrid Cloud Challenges
- Cisco InterCloud
- InterCloud Director
- InterCloud Secure Fabric
- InterCloud Provider Enablement Platform
- Summary

Cisco InterCloud:
Announced at Cisco Live
Milan, January 2014

Why Hybrid Clouds?

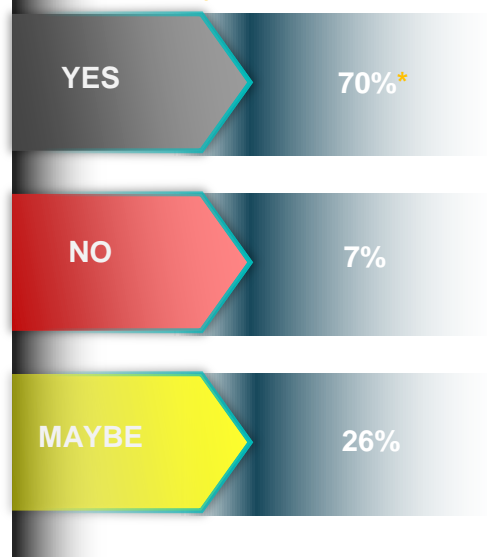
It is all about the workload

- Choice to build & rent across providers
 - Workload portability
 - Consistent security



Customers Want Hybrid Clouds, Not Just IaaS

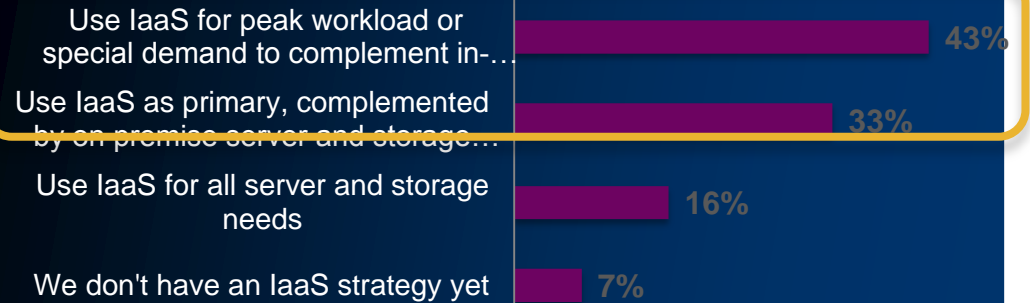
Will your enterprise be pursuing a hybrid cloud computing strategy by 2015?



Source: Gartner DC Summit, December 2012
(Base 400+ Enterprise customers)

Customers seek to leverage service provider clouds to augment, not replace on premise servers

Which statement best describes your firm's current or planned strategy regarding the use of service providers for cloud IaaS?



Source: Forrester, 2013 (study commissioned by Cisco)

Hybrid Cloud Challenges

Inability to Access Resources Across Any Cloud, with Security and Ease

Loss of Security



- Unsecure Connection
- Limited Workload Protection

Siloed Infrastructure



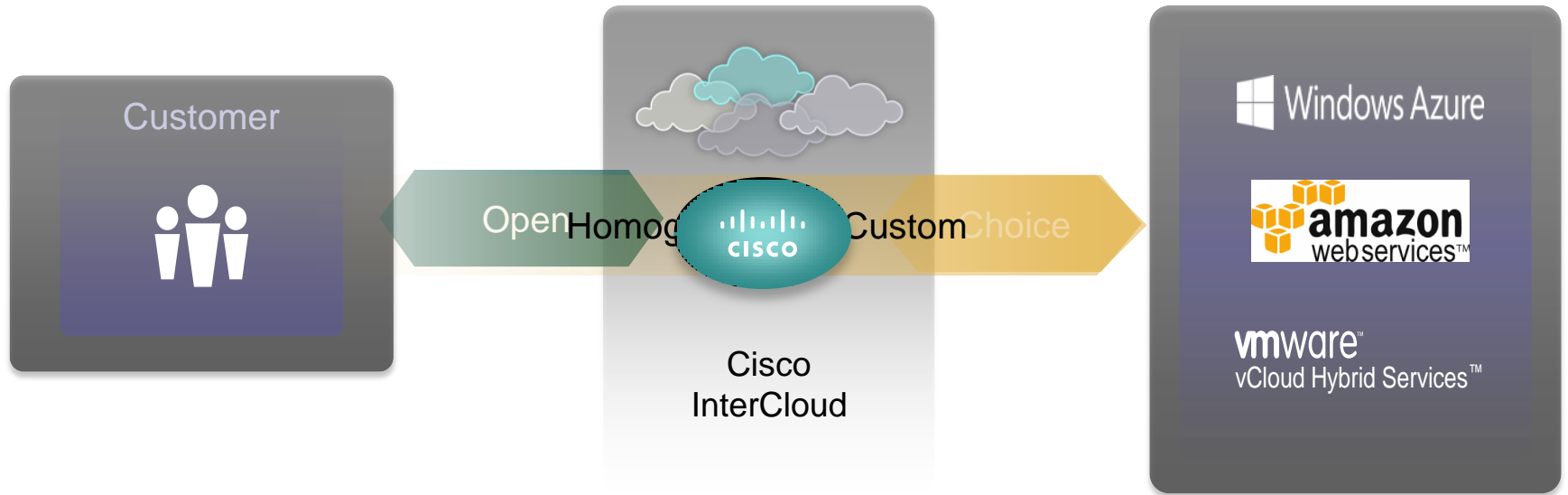
- Inconsistent cloud architectures
- Fragmented solutions solving networking and security challenges
- Different Management Tools

Slow and Complex



- Require app re-configuration
- Slow and manual process of discovering infrastructure dependencies
- No Visibility or Control

Cisco's Hybrid Cloud Approach

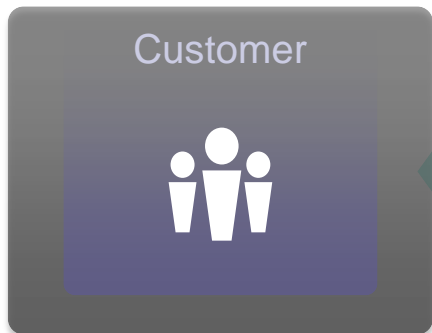


Cisco's Hybrid Cloud Differentiation

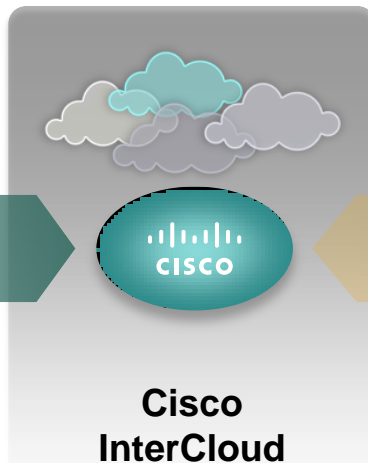
No Vendor Lock-In

Any Hypervisor to Any Provider

Heterogeneous Infrastructure



Open



Choice

Cloud Providers

Cloud Brokers

Cisco Powered Services

Open Ecosystem



End-to-End Security

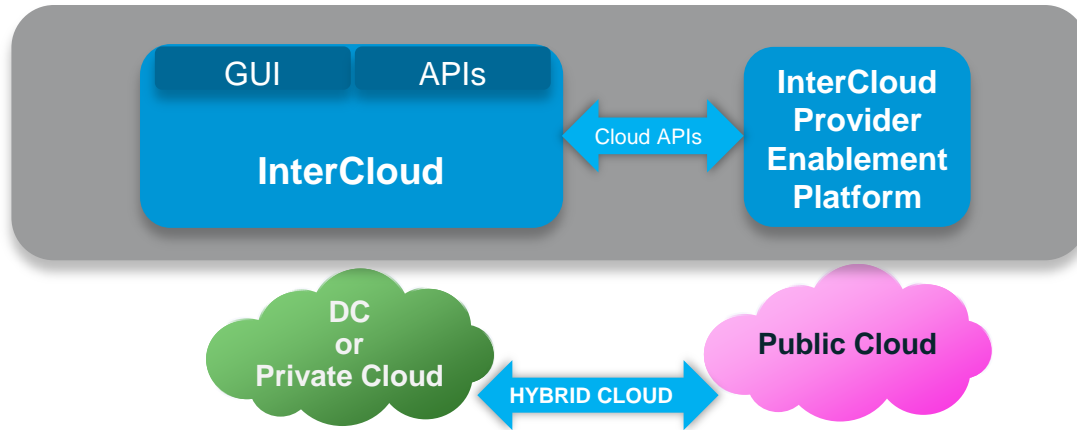
Unified Workload Management and Governance

Workload Mobility Across Clouds

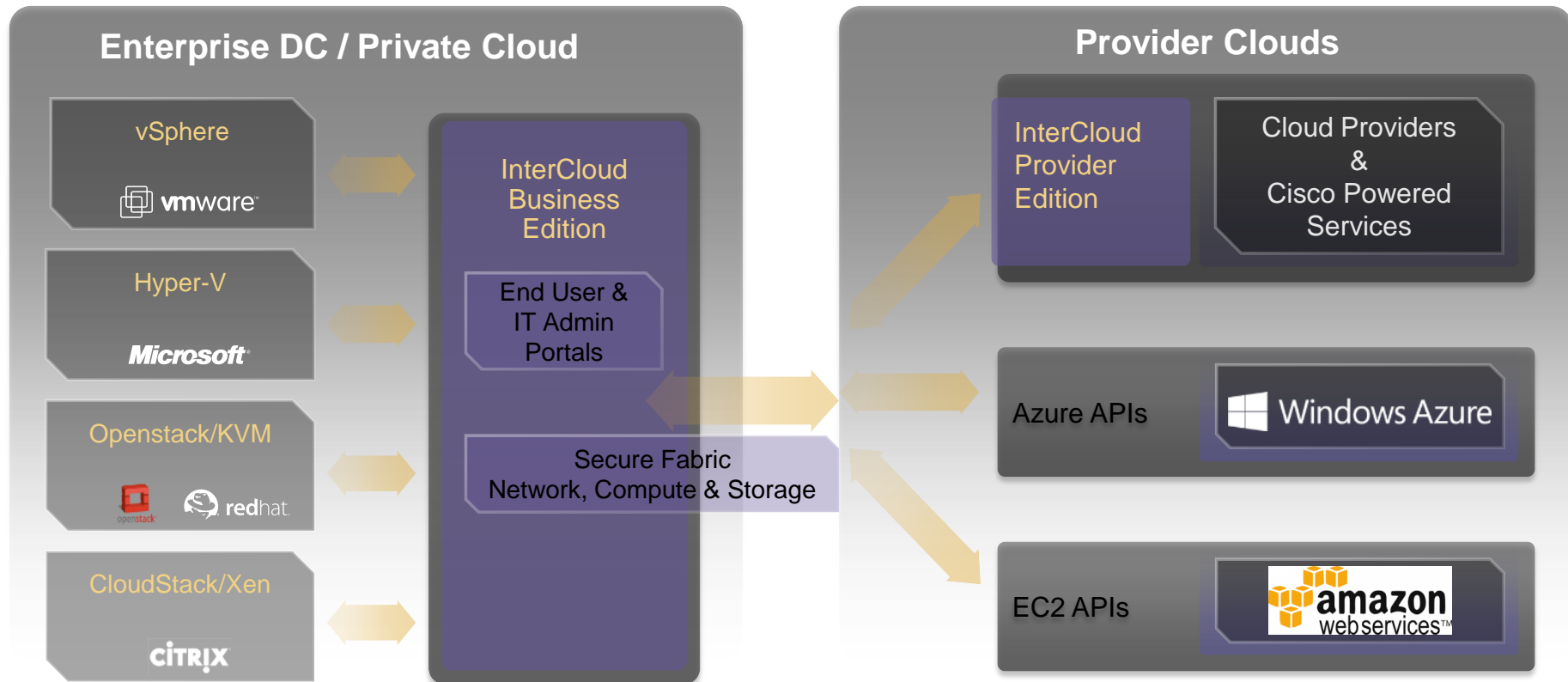
Cisco *live!*

Cisco InterCloud Overview

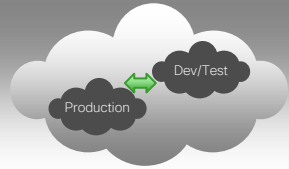
Software based Solution



Cisco InterCloud – Solution Overview



Intercloud Supports Key Hybrid Cloud Use Cases



Dev/Test

Dev/Test Application
across Private and
Public Cloud

*Bring Back Workload for
Production Scale*



Shadow IT Control

Providing Rapid Access
to Hybrid Cloud
Capacity

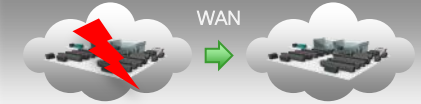
*IT in Control of What and
Where Applications Can
Be Deployed*



Capacity Augmentation

Bursting from Private
Cloud to Public Cloud for
Peak Workloads

*No Change to Application,
Networking and Security*

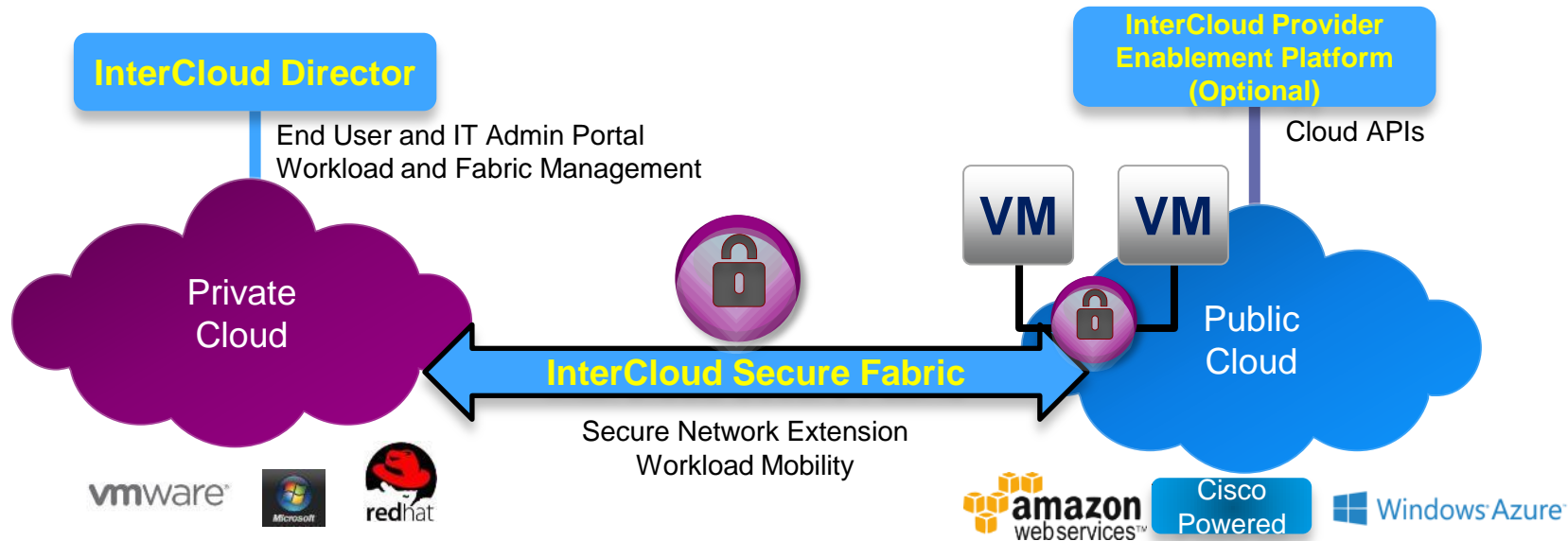


Disaster Recovery*

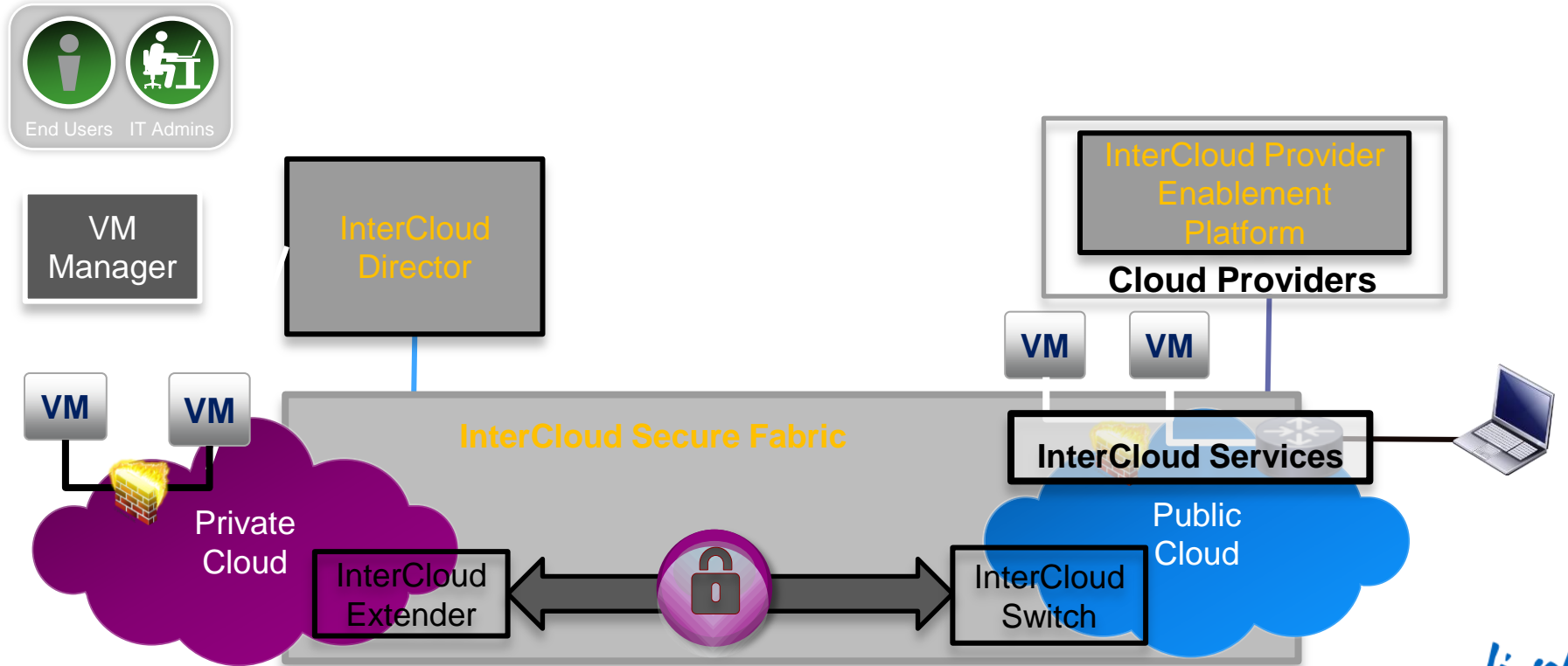
Use Public Clouds for
Backup and Disaster
Recovery

*Securely Extend DC with
Consistent Policies*

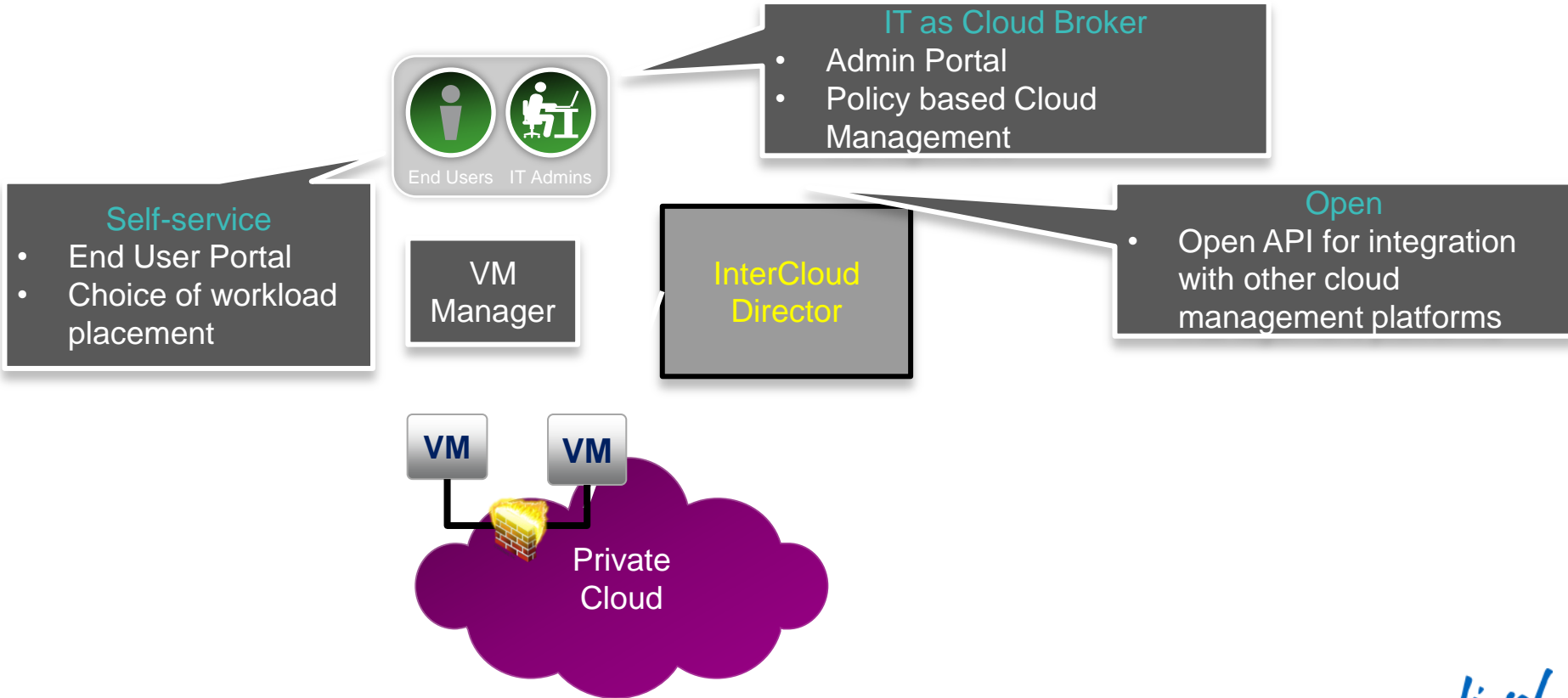
Cisco InterCloud Architecture



Cisco InterCloud Architectural Details



Cisco InterCloud Director Features



InterCloud Director



Application Owners

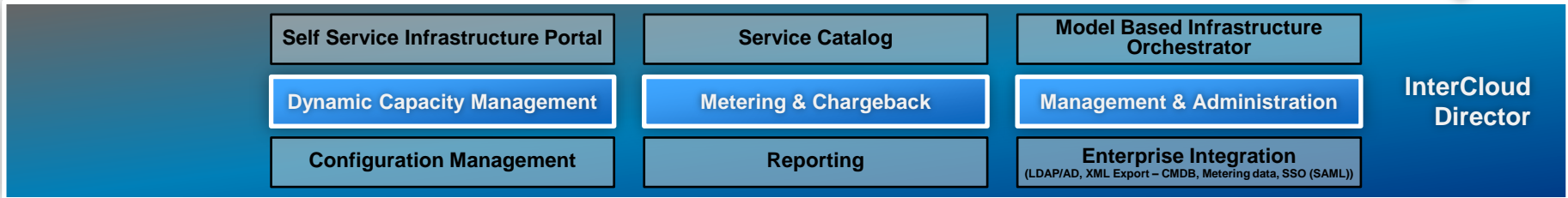


IT Admins



IT Operations

Open API



Physical Infrastructure

Compute Network Storage Customer Choice

Virtual Infrastructure

InterCloud Secure Fabric

Centralised Lifecycle Management of Physical, Virtual and Cloud Infrastructure

InterCloud Director Capabilities

- Single Console for Managing Physical, Virtual, and Cloud Workload
 - Based on proven UCS Director platform
 - Administrator and self-service portals
 - Migrate VM to public cloud or create VM from template
- Security
 - Users and user groups provide role-based access control and multi-tenancy support
- Workload Placement Policies
 - Administrator creates catalogs to be shared with specific users/user groups
 - Policies to restrict placement of workload based on max/min number of VMs

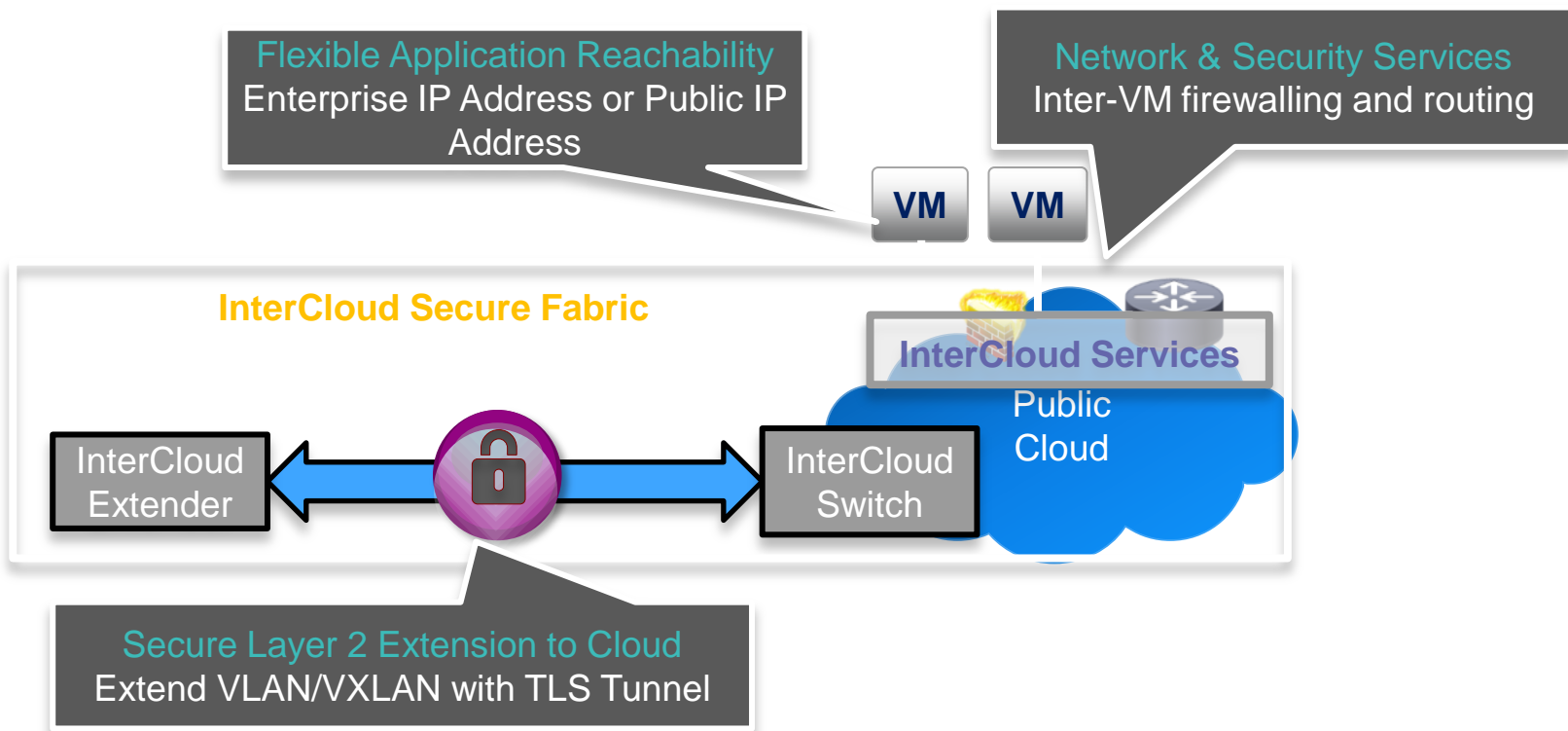
InterCloud Director Administrator Portal Tasks

- VDC creation corresponding to a VPC within InterCloud
- Configure network policy and service policies for InterCloud
- Create InterCloud Secure Fabric instances – instantiate InterCloud Extender and InterCloud Switch virtual appliances
- VDC Catalog creation – catalog will include local templates from VMM and cloud templates populated from InterCloud Secure Fabric Manager
- User and User group configuration
- Instantiation and configuration of InterCloud Services such as InterCloud VSG and CSR 1000V

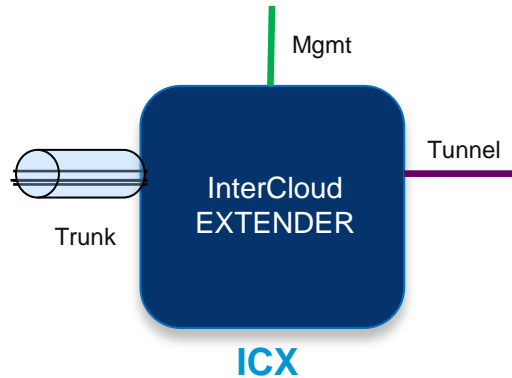
InterCloud Director End-User Portal Tasks

- End-user portal is based on the VDC assigned to a user
- User can view VM inventory in the private cloud and can select a VM to migrate to a public cloud
- Service Request could be to create a VM from template in the cloud – selected from the catalog published for a VDC by the administrator

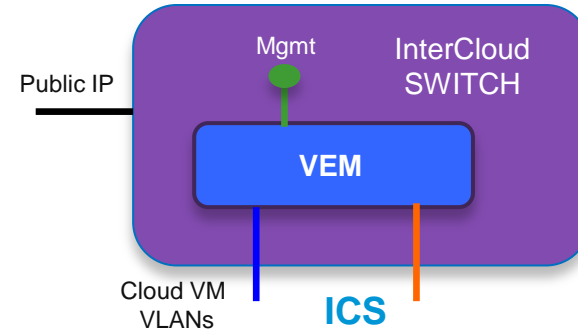
InterCloud Secure Fabric Key Features



InterCloud Extender and InterCloud Switch Interfaces



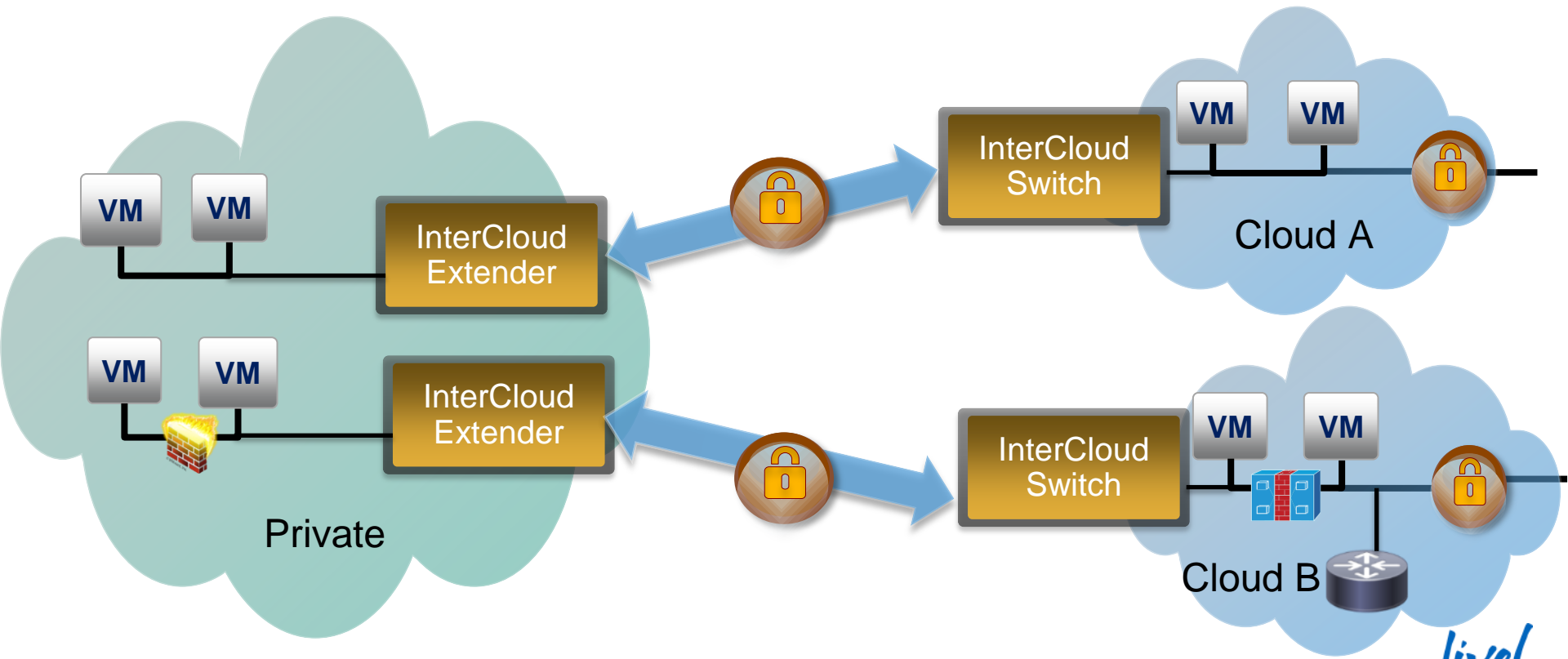
- **Management Interface** – Used for communication with InterCloud VSM and Cisco Prime Network Controller. Can also be used as secure tunnel endpoint if routed into public space.
- **Tunnel interface** – Can be used for secure tunnel to InterCloud Switch
- **Trunk interface** – Enterprise trunk allowing all VLANs that are being extended



- **Management Interface** – Used for communication with InterCloud VSM and cloud VMs.
- **Public interface** – Provider interface with public IP. Used to communicate with Cisco Prime Network Controller and as tunnel endpoint
- **Cloud VM interfaces** – Access Tunnels to cloud VMs on VLANs extended from the enterprise

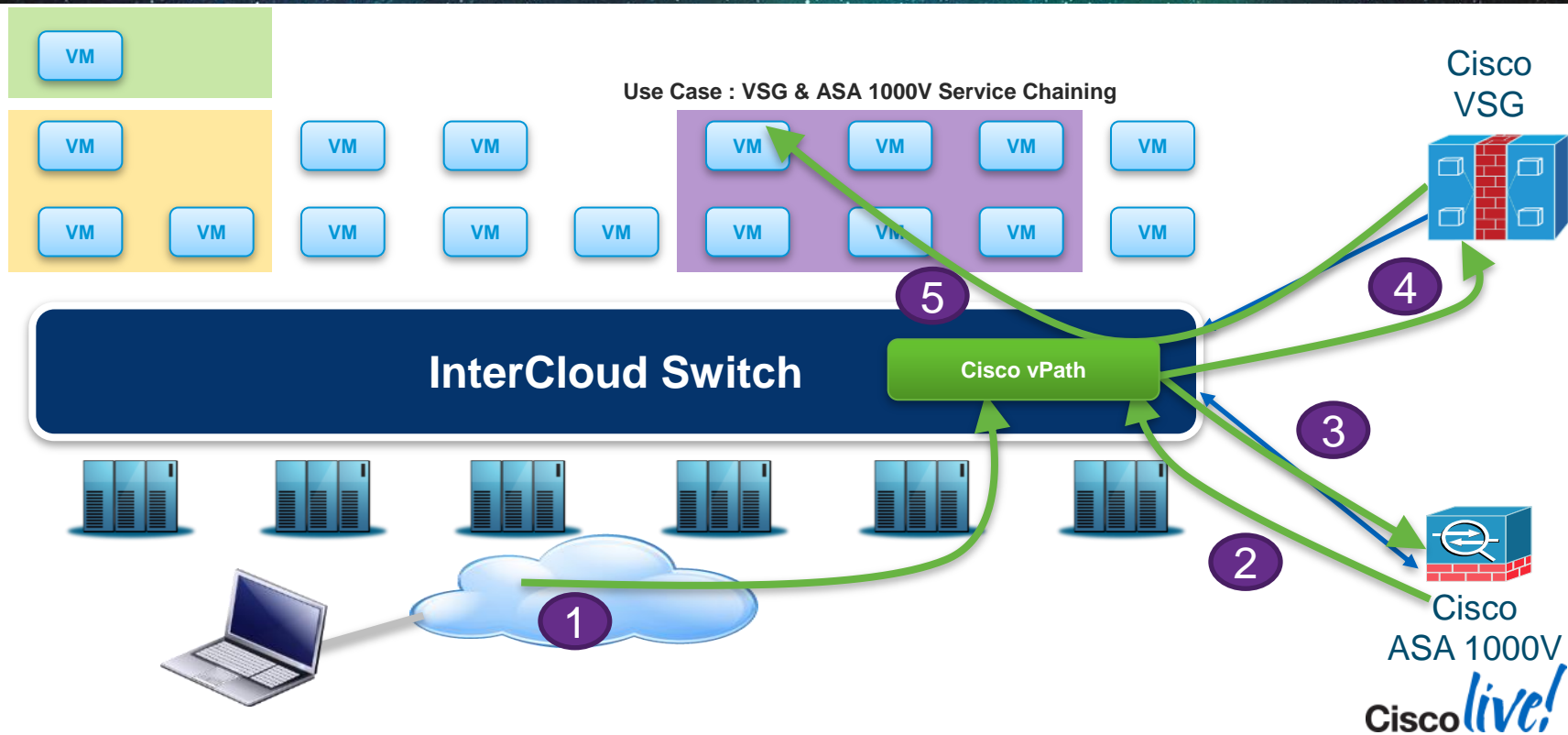
InterCloud Secure Fabric

Connecting to multiple Clouds

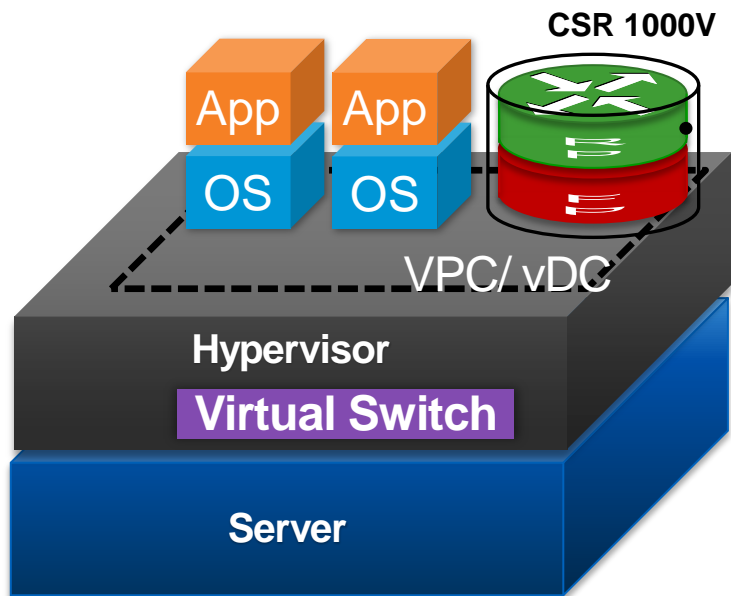


Security Services Chaining in the Cloud

Intelligent traffic steering through multiple network services



CSR 1000V – Cloud Services Router



IOS-XE code base

- Selected IOS-XE features for Cloud Use Cases

Infrastructure Agnostic

- Server, Switch and Multi-Hypervisor
 - Cisco UCS/etc –Intel Nehalem and higher CPU
 - Runs on N1KV,vSwitch,dVS, etc
 - VMware ESXi 5.0 supported. Xen and Red Hat KVM future
 - Amazon AMI support in future

Single Tenant WAN Gateway with Light Footprint

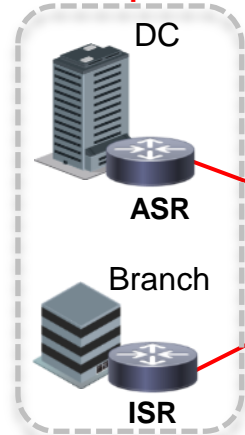
- 4 vCPU today (2 cores *2 = 4 vCPU with Hyper Threading)
- Cloud Provide Economies of Scale for higher instances.

RESTFul APIs for Cloud Automation

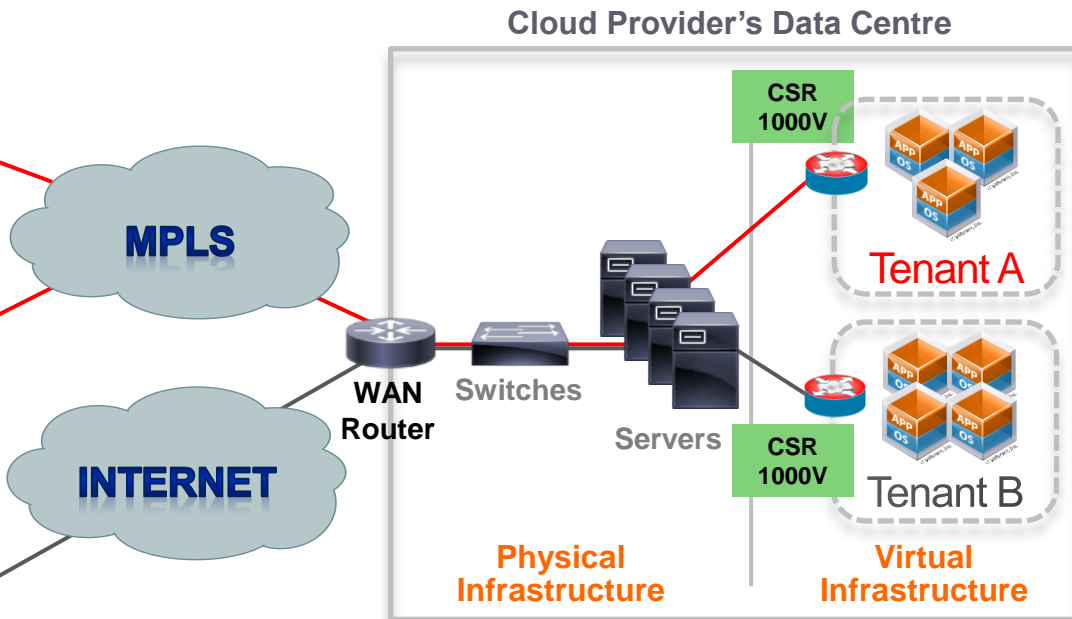
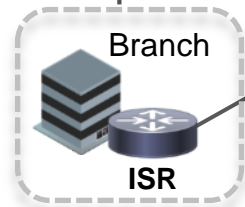
Single-Tenant Gateway in the Cloud

Can be deployed by Enterprises or Cloud Providers

Enterprise A



Enterprise B



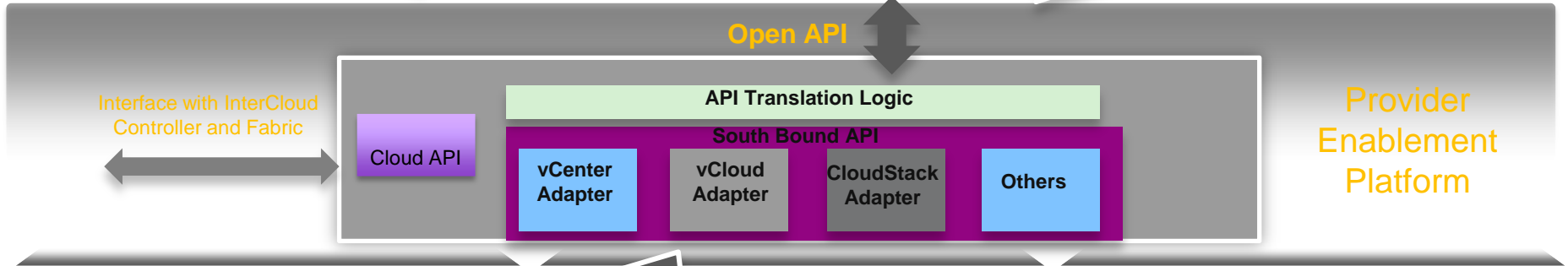
Current Use Cases

- MPLS CE Router (vCE)
- Network Services – VPN Gateway, Control Point
- Hybrid Cloud Connectivity

InterCloud Provider Enablement Platform Features

Rapid Deployment
Enable Cloud Provider to Quickly Offer Hybrid Cloud Services

Open API
For Integration with Cloud Provider Infrastructure

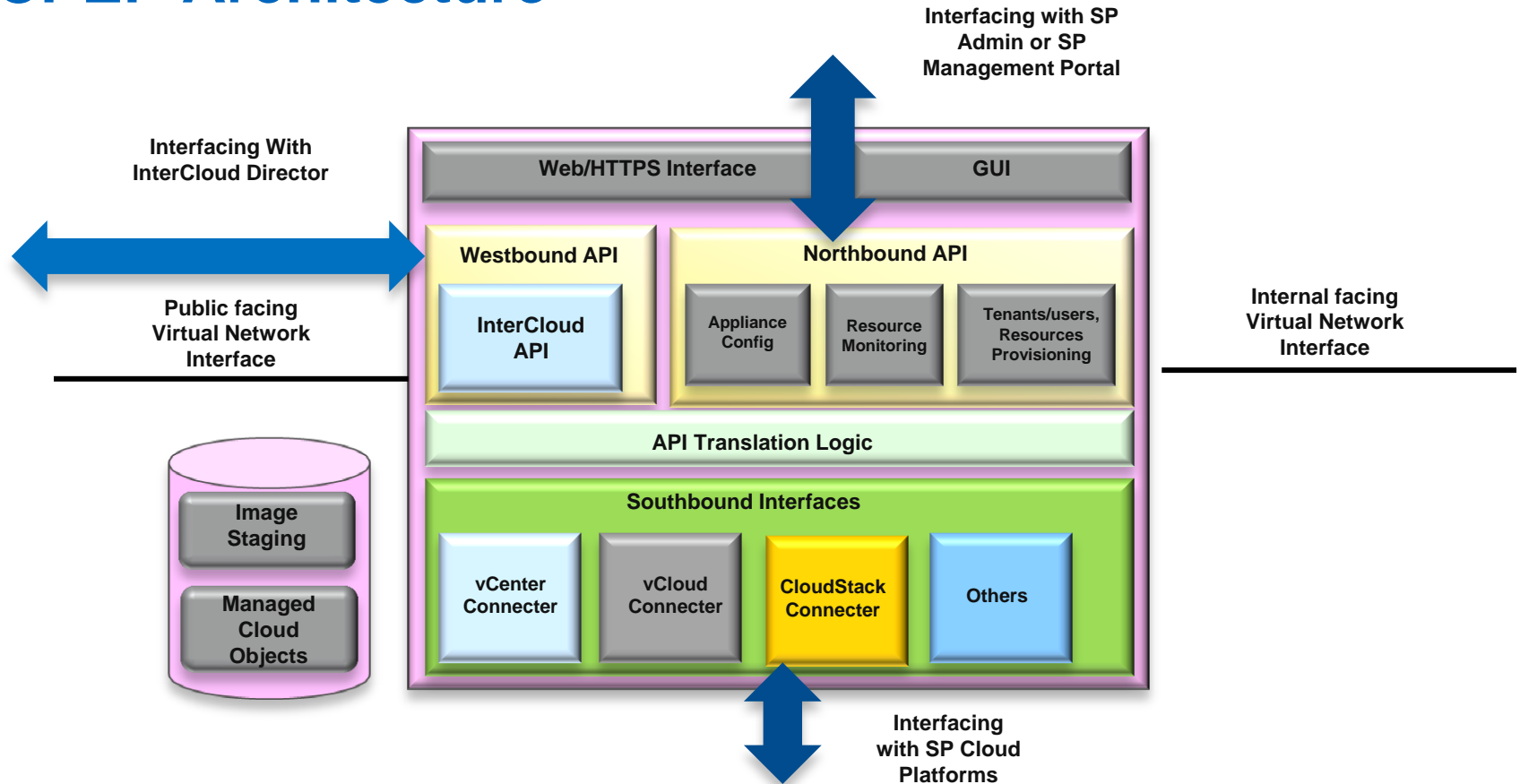


Flexible
Abstraction over Cloud Provider Infrastructure

InterCloud Provider Enablement Platform Functionality

- InterCloud Partner Enablement Platform (ICPEP) is a virtual appliance that provider can deploy on their provider network enabling public cloud management API interface.
- Provides cloud API standardisation for Cisco-powered SP.
- Abstracts the complexity of different public cloud APIs
- For the InterCloud Provider Edition version, cloud provider can run multiple ICPEP instances to access resources programmatically.

ICPEP Architecture



ICPEP Modules

- Northbound API: Implements a set of APIs for cloud provider admin to use to configure the appliance, to provision tenants and users, and to monitor tenants operations
- East/Westbound API: Implements the InterCloud API enabling connectivity and control to InterCloud Director
- Southbound API Interface: Implements the various cloud platform interfacing adapters, each of which is responsible for interfacing with a specific cloud platform such as vCloud Director
- API Translation Logic – This module implements the logic of translation between InterCloud APIs and provider specific APIs

Cisco InterCloud Offers

Solution : Cisco InterCloud

Product Offer for Enterprise

Cisco InterCloud Business Edition

Product Components :
InterCloud Director
InterCloud Secure Fabric

Product Offers for Cloud Providers

Cisco InterCloud Provider Edition

Product Components :
InterCloud Director
InterCloud Secure Fabric

InterCloud Provider
Enablement Platform

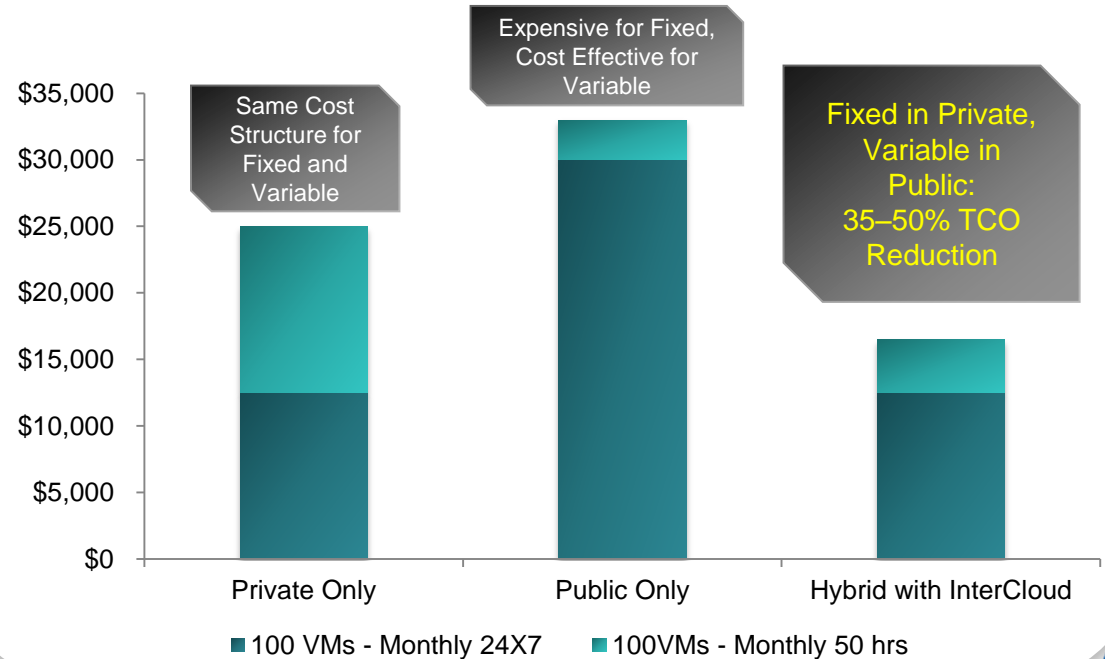
InterCloud Provider
Enablement Platform

Intercloud Business Model and ROI

Buy the Base, Rent the Peak

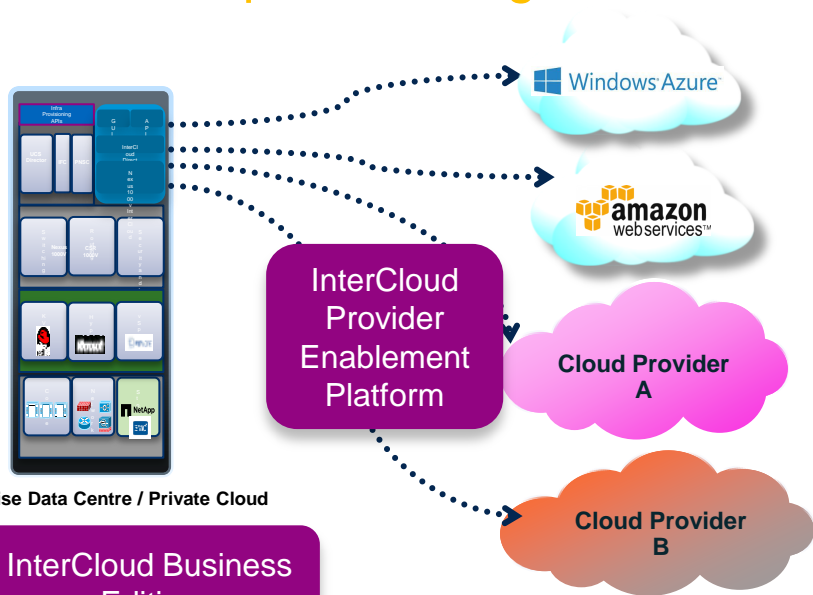
- “InterCloud ports” for hybrid VM pools
- Subscription based OpEx model
- ~10% add-on on IaaS costs
- Up to 50% cost reduction over Private or Public only models

**Total Monthly Cost of 200 VMs:
100 Sustained, 100 Variable**



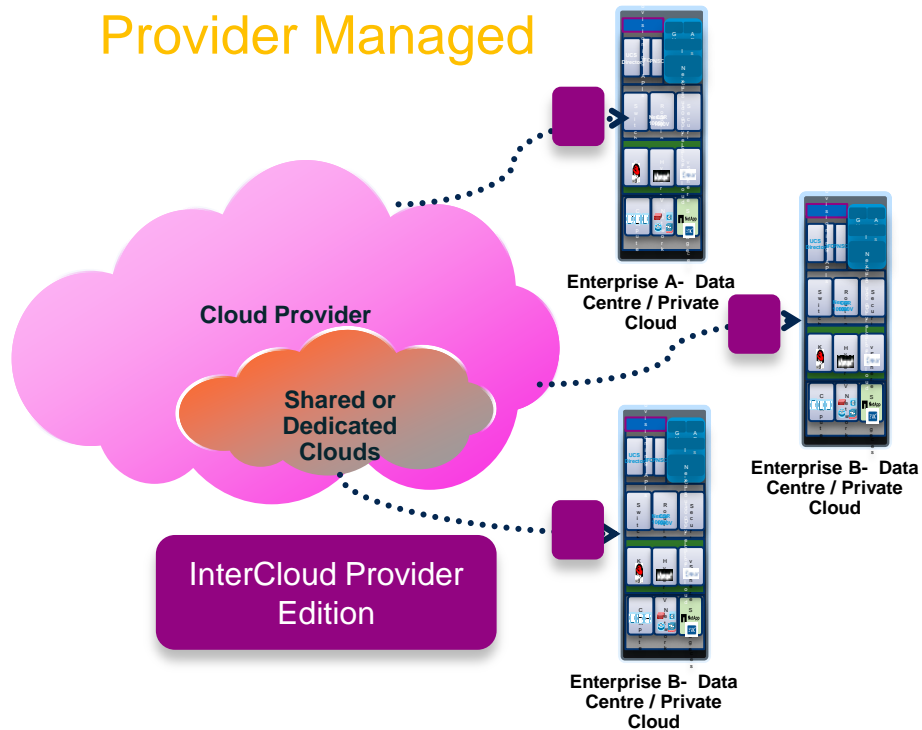
InterCloud Deployment Models

Enterprise Managed



- Enterprise procures and deploys software on-premise
- Choice of InterCloud enabled provider clouds
- No extra provider charge for InterCloud

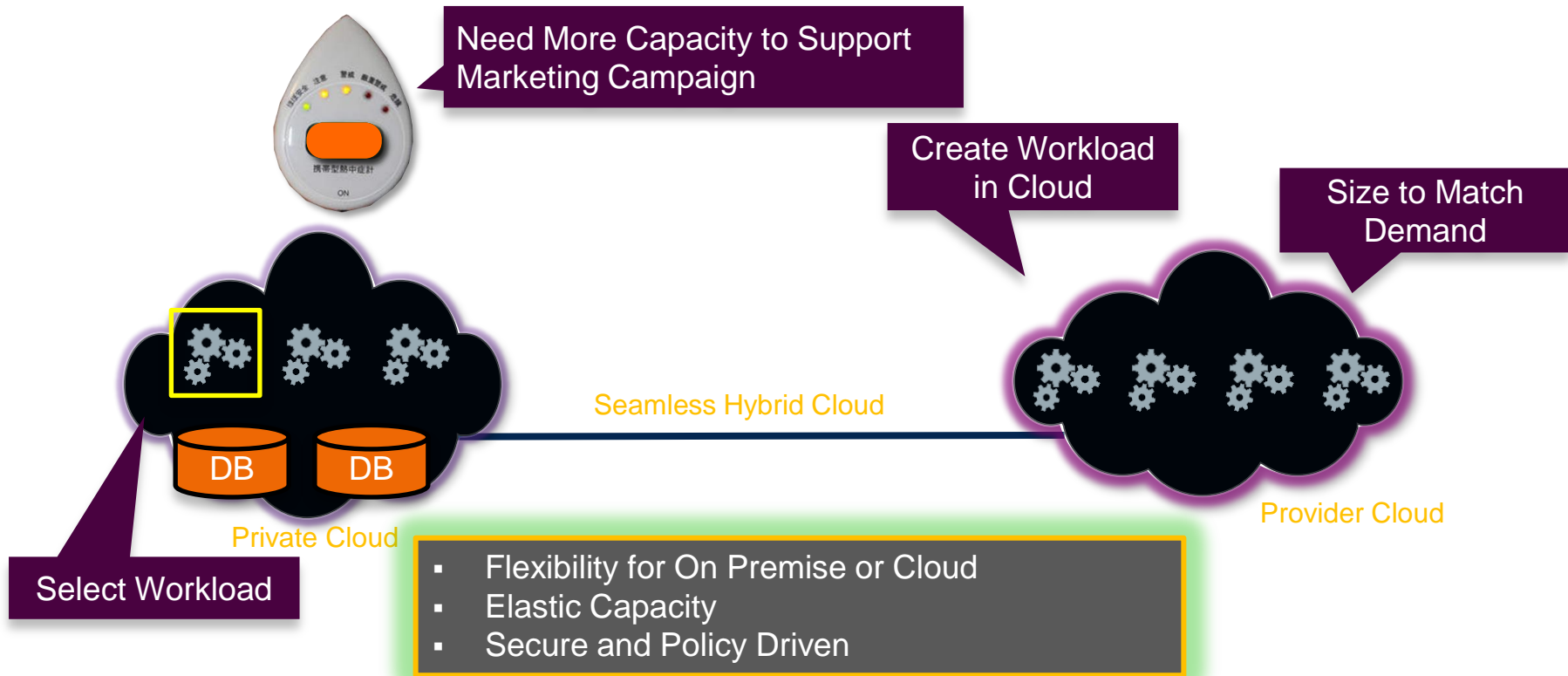
Provider Managed



- Provider procures and deploys software at enterprise
- Enterprise controls workload placement
- Enterprise pays provider for InterCloud service

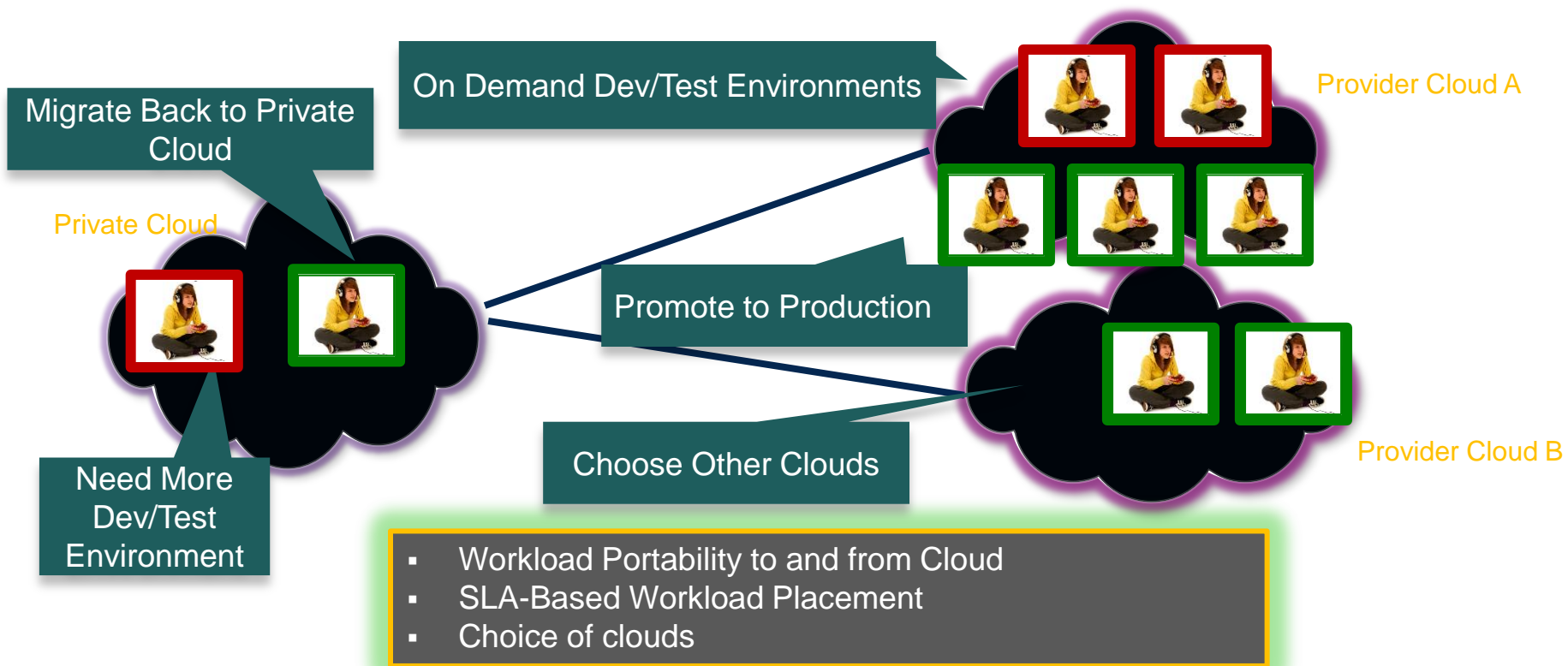
InterCloud Enabling Capacity Augmentation Use Case

Marketing Company Needs Resources to Run Time Sensitive Web Campaign



InterCloud Enabling Dev/Test Use Case

Online Gaming Company Needs Faster Access to Resources to Test New Games



Cisco InterCloud Benefits for Business



Choice Of Infrastructure to Meet Changing IT Requirements

Open

Heterogeneous On-Premises and Public Cloud Infrastructure

Multi-Cloud Support

Multi-Hypervisor Support



Protect Business Assets and Meet Compliance

Secure

Secure, Scalable Connectivity to Extend Private Cloud to Public Cloud

Consistent Policy Enforcement throughout the Hybrid Cloud

Workload Security in Public Cloud



Consistent Operations and Workload Mobility Across Clouds

Flexible

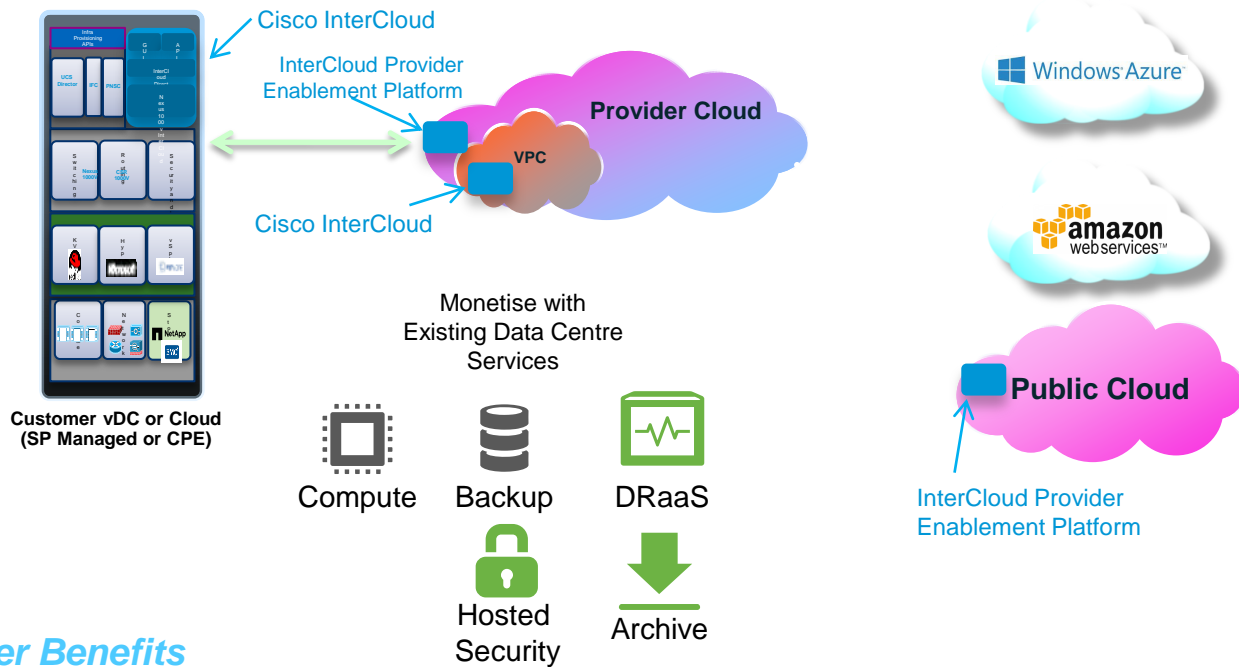
Unified Hybrid Cloud Management for Users and IT Admins

Workload Portability To and From Physical/Virtual/Hybrid Cloud

Policy Based Workload Placement

Provider Managed InterCloud Service Offerings

Enabling Cloud Aggregation/Brokering



Provider Benefits

- Deliver complete managed cloud solution incorporating private, virtual private and public resources
- Provide composite environment leveraging 'best fit' clouds
- Avoid competing on low margin, commodity workloads while maintaining overall management
- Differentiate on both customer -> Public Cloud and VPC -> Public Cloud performance

Cisco InterCloud Value Proposition for Cloud Providers



Remove friction

Enterprise On-boarding

Secure, Scalable Connectivity to Extend Enterprise to Public Cloud

Workload mobility to easily move apps to provider infrastructure

Unified Hybrid Cloud Management to manage workloads across enterprise and provider clouds



Business & Technology Value

Differentiation

Managed hybrid cloud service offering for the enterprise

One-Stop shop for hosted/dedicated/elastic consumption models

Advanced workload security and bare-metal mobility for Cisco powered



Expand Cloud Services

Value Added Services

Offer new services for Disaster Recovery, Applications-onboarding, etc.

Offer advanced networking and security services

Cisco InterCloud Ecosystem

Cisco Provider Partners



Cisco Technology Partners



Cisco InterCloud : Secure Workload Mobility



Choice: Freedom to place workloads across heterogeneous Clouds

Consistency: Security and networking as an extension of Private Cloud

Control: Unified management to move workloads across clouds

Compliance: Policy & governance while using Public Cloud Infrastructure



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