



Enterprise Class Cloud Management

TAPINSYSTEMS

Feb 24, 2010

TAPINSYSTEMS

The Problem: Managing Cloud Complexities

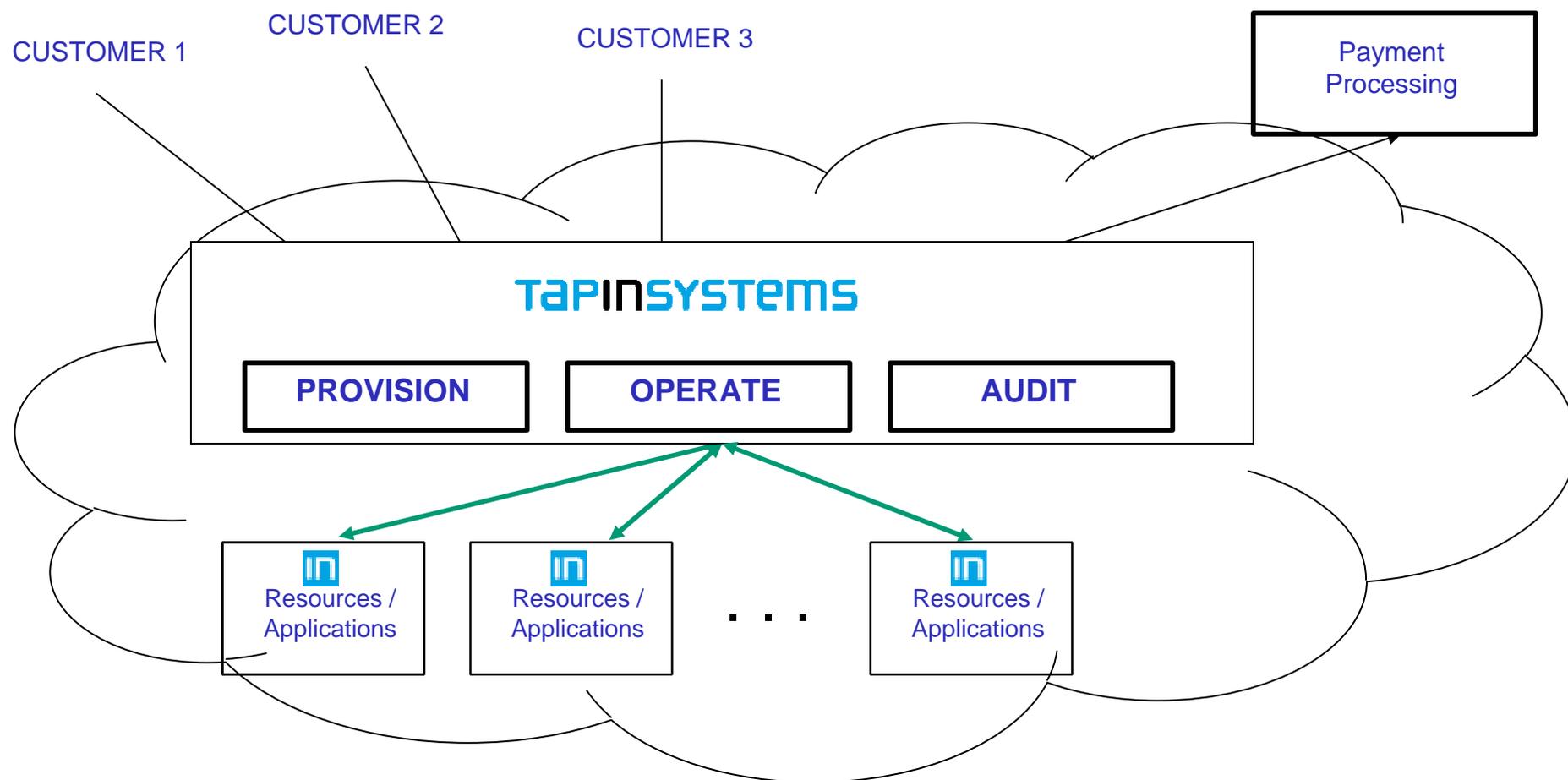
The Cloud offers compelling benefits, but also introduces new complexities:

- How do you comply with management policies for **auditing** of cloud resources including service levels, performance, usage and billing reports?
- How do you **provision** cloud application resources? Virtualization requires new deployment processes.
- How do you monitor and **operate** resources that are outside your control?
- How can you **allocate** resources appropriately and dynamically?
- How can you **decrease dependence** on a sole cloud vendor
- How can you optimally use **multiple cloud services**?

TAPINSYSTEMS solves these problems

TAPINSYSTEMS

Tap In Cloud Resource Management



- Platform for independent management, deployment and reporting of resources, configurations and services within multi-vendor cloud environments

Tap In - Benefits

- Improve revenue flows with integrated usage-based billing
- Provide cloud users “enterprise features” they are use to having
 - Service level, usage, performance reports
 - Deep monitoring and alerting capability
 - Industry/Corporate compliance reports
- Reduce resources and skills required to deploy cloud applications by simplifying and automating deployment
- Easily integrate with multiple cloud services by using pre-built Tap In interface modules
- Easily integrate cloud service with customer policies

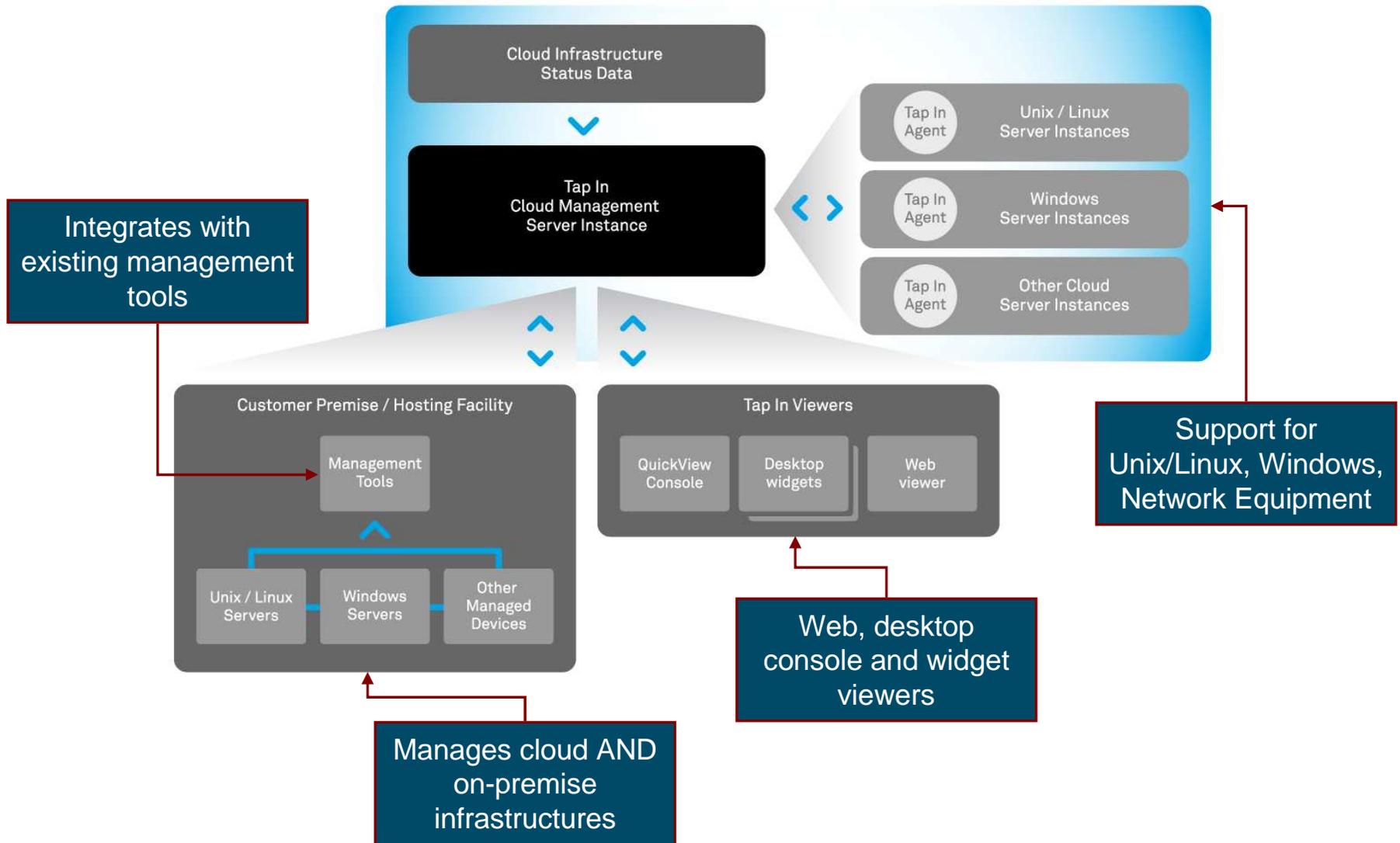
Enabling customer migration to the cloud

Tap In - Technology

- **Management Server**
- **Client Applications**
 - Operations console – client event viewer
 - Web application – Browser based functions
 - Control Plan Editor – business process modelling and automation
- **Interfaces Modules**
 - Managed technologies
 - Other management systems
 - Cloud interfaces
- **Automation Server**
 - Control Plan automation server

Technology

Tap In Cloud Management Service (CMS)



Managed Technologies

- **Unix/Linux**
 - Via Tap In Linux/Unix agent (Perl)
 - Nagios plugin support
- **Windows**
 - Via Tap In's Powershell Agent for Systems Center Operations Manager, Exchange, Active Directory, Event Logs, and application .COM or .NET objects
- **Network devices**
 - SNMP query to access MIB-based data
 - Module for HA Proxy load balancers
- **Cloud Services – interfaces to OpSource API**
 - Interface Module gathers cloud resource configuration status from OpSource API
 - Control Plan allows automation of deployment

Cloud Operations

- Tap In Systems provides operational systems management services of IT cloud and data center resources for enterprises.
- Tap In System's service is delivered from the cloud using a Software as a Service (SaaS) model.
- The service offering includes:
 - Deep monitoring capability equivalent to traditional enterprise tools, like HP OpenView, IBM Tivoli and BMC.
 - Broad monitoring of heterogeneous cloud vendor services consolidated into a single management system
 - Able to manage dynamic, virtualized cloud environments
 - Enables enterprise automation processes by integrating with existing tools

TAP IN CLOUD MANAGEMENT SERVICE (CMS)

QuickView: Real Time Status

ID	SEV	GROUP	COUNT	FIRST	LAST	EMS	CLASS	RULE	T1	T2	T3	N3
000043	5	null	29	2010-02-23 20:51:46.137	2010-02-23 23:19:00.594	10-162-124	Tapin	ScheduleOC	schedule	localhost	HA	Connected to Spider.Completed HAProxy
000009	5	null	341	2010-02-23 20:20:03.453	2010-02-23 23:19:53.946	10-162-124	Tapin	performance	host	localhost		Total-Mem=10007936 Used-Mem=6160016 Free-Mem=3884
000074	5		4	2010-02-23 22:45:53.000	2010-02-23 23:02:15.909	10-162-124	OpSource_Cloud	server_status	HOST	10.162.124.12		Server 929f590e-3153-416e-af73-5ee248ce0ce1-privateIPAd
000073	5		4	2010-02-23 22:45:53.000	2010-02-23 23:02:15.909	10-162-124	OpSource_Cloud	check_mem	HOST	10.162.124.11		Server f06f950-245e-4a80-9056-47cee75426e0-privateIPAd
000060	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.868	10-162-124	OpSource_Cloud	check_mailq	HOST	10.162.124.11		Memory OK - 77.9% (1619340 kB) free (pct=77.9
000061	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.876	10-162-124	OpSource_Cloud	check_disk	HOST	10.162.124.11		OK mailq is empty(used=0.20.30.0
000052	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.876	10-162-124	OpSource_Cloud	check_swap	HOST	10.162.124.11		DISK OK - free space /boot 69 MB (74% inode=99%) /boot=23
000053	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.888	10-162-124	OpSource_Cloud	check_load	HOST	10.162.124.11		DISK OK - free space / 4460 MB (59% inode=95%) /=3006MB
000054	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.888	10-162-124	OpSource_Cloud	check_load	HOST	10.162.124.11		OK - load average: 0.00, 0.00, 0.00 load1=0.0004, 0.0010, 0.0000
000055	5		15	2010-02-23 22:10:02.000	2010-02-23 23:20:01.900	10-162-124	OpSource_Cloud	check_swap	HOST	10.162.124.11		SWAP OK - 100% free (1983 MB out of 1983 MB) swap=1983MB
000056	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.267	10-162-124	OpSource_Cloud	check_mailq	HOST	10.162.124.12		Memory OK - 78.0% (1617876 kB) free (pct=78.0
000057	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.266	10-162-124	OpSource_Cloud	check_mailq	HOST	10.162.124.12		OK mailq is empty(used=0.20.30.0
000058	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.267	10-162-124	OpSource_Cloud	check_disk	HOST	10.162.124.12		DISK OK - free space /boot 69 MB (74% inode=99%) /boot=23
000059	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.267	10-162-124	OpSource_Cloud	check_disk	HOST	10.162.124.12		DISK OK - free space / 4964 MB (66% inode=95%) /=2502MB
000060	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.267	10-162-124	OpSource_Cloud	check_load	HOST	10.162.124.12		OK - load average: 0.00, 0.00, 0.00 load1=0.0004, 0.0010, 0.0000
000061	5		14	2010-02-23 22:15:02.000	2010-02-23 23:20:02.268	10-162-124	OpSource_Cloud	check_swap	HOST	10.162.124.12		SWAP OK - 100% free (1983 MB out of 1983 MB) swap=1983MB
000049	5	GROU	5	2010-02-23 20:54:20.000	2010-02-23 22:05:01.988	10-162-124	Linux	check_lead	HOST	10.162.124.11		SWAP OK - 100% free (1983 MB out of 1983 MB) swap=1983MB
000048	5	GROU	5	2010-02-23 20:54:20.000	2010-02-23 22:05:01.997	10-162-124	Linux	check_lead	HOST	10.162.124.11		OK - load average: 0.00, 0.00, 0.00 load1=0.0004, 0.0010, 0.0000
000047	5	GROU	5	2010-02-23 20:54:20.000	2010-02-23 22:05:01.977	10-162-124	Linux	check_disk	HOST	10.162.124.11		DISK OK - free space / 4460 MB (59% inode=95%) /=3006MB
000046	5	GROU	5	2010-02-23 20:54:20.000	2010-02-23 22:05:01.968	10-162-124	Linux	check_disk	HOST	10.162.124.11		DISK OK - free space /boot 69 MB (74% inode=99%) /boot=23
000045	5	GROU	5	2010-02-23 20:54:20.000	2010-02-23 22:05:01.967	10-162-124	Linux	check_mailq	HOST	10.162.124.11		OK mailq is empty(used=0.20.30.0
000044	5	GROU	5	2010-02-23 20:54:19.000	2010-02-23 22:05:01.898	10-162-124	Linux	check_mem	HOST	10.162.124.11		Memory OK - 78.0% (1617876 kB) free (pct=78.0
000042	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.048	10-162-124	HA Proxy	queue	hostname	haproxyhost	demo	BA OK Status UP qmax=0 qcur=0
000041	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.047	10-162-124	HA Proxy	queue	hostname	haproxyhost	www	bck OK Status UP qmax=0 qcur=0
000039	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.046	10-162-124	HA Proxy	queue	hostname	haproxyhost	www	w OK Status UP qmax=0 qcur=0
000040	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.045	10-162-124	HA Proxy	queue	hostname	haproxyhost	www	BA OK Status UP qmax=22 qcur=0
000038	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.045	10-162-124	HA Proxy	queue	hostname	haproxyhost	bck	OK Status UP qmax=0 qcur=0
000036	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.044	10-162-124	HA Proxy	queue	hostname	haproxyhost	git	w OK Status UP qmax=0 qcur=0
000037	5	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.044	10-162-124	HA Proxy	queue	hostname	haproxyhost	git	BA OK Status UP qmax=4 qcur=0
000035	4	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.043	10-162-124	HA Proxy	sessions	hostname	haproxyhost	http-in	loc OPEN Status OPEN stot=0 smax=0 scur=0 slim=100
000033	4	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.042	10-162-124	HA Proxy	sessions	hostname	haproxyhost	http-in	IPV OPEN Status OPEN stot=63284 smax=27 scur=1 slim=100
000034	4	12345	29	2010-02-23 20:51:35.000	2010-02-23 23:17:50.042	10-162-124	HA Proxy	sessions	hostname	haproxyhost	http-in	FR OPEN Status OPEN stot=576628 smax=32 scur=1 slim=100

Total: 59

Filter:

- Event console similar to enterprise tools like IBM/Tivoli, HP OpenView, BMC
- Consolidate OpSource cloud and data center events

TAP IN CLOUD MANAGEMENT SERVICE (CMS)

Web Application: Status and Reports

The screenshot displays the TapInSystems web application interface. The top navigation bar includes 'Home', 'Status', 'Analysis', 'Control', 'Configuration', and 'My Configuration'. The main content area is divided into three sections:

- Classes:** A tree view showing the hierarchy of classes, including 'OpSource_Cloud' and 'HOST 10.162.124.11'.
- Object Details:** A table showing configuration meta-data for the selected object (10.162.124.11).
- Events:** A table showing a list of events for the selected class and host.

Object Details Table:

Property	Value
Object	10.162.124.11
Class	OpSource_Cloud
name	TapIn_1
memory	2048
isStarted	true
operatingSystem.displayName	CENTOS5
imageResourcePath	
vlanResourcePath	/oec/1aa31d93-5e18-43c8-a098-4dc01562a122/network/87d74c34-8d45-4180-ad45-65a8071c0a86
osStorage	10
isDeployed	true
id	f86f8f30-245a-4a80-9856-47cee75426e6
additionalLocalStorage	0
description	Tap In Management Server
machineName	10-162-124-11
cpuCount	1
operatingSystem.type	UNIX
created	2010-02-21T23:41:14.911Z

Events Table:

ID	LAST	FIRST	COUNT	RULE	EGROUP	PRIORITY	MESSAGE	EID	EMS
113	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_swap	unassigned	50	SWAP OK - 100% free (1983 MB out of 1983 M	55	10-162-1;
115	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_load	unassigned	50	OK - load average: 0.00, 0.00, 0.00 load1=0.00	54	10-162-1;
118	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_disk	unassigned	50	DISK OK - free space: / 4460 MB (59% inodes=	53	10-162-1;
117	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_disk	unassigned	50	DISK OK - free space: /boot 69 MB (74% inodes=	52	10-162-1;
116	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_mailq	unassigned	50	OK: mailq is empty unsent=0;20;30;0	51	10-162-1;
114	2010-02-24 02:20:01	2010-02-24 01:10:02	15	check_memory	unassigned	50	Memory OK - 77.9% (1615840 kB) free pct=77	50	10-162-1;
133	2010-02-24 02:02:15	2010-02-24 01:45:53	4	server_status	unassigned	50	Server f86f8f30-245a-4a80-9856-47cee75426	73	10-162-1;

- Shows OpSource configuration meta-data

TAP IN CLOUD MANAGEMENT SERVICE (CMS)

Web Application: Status and Reports

TAPINSYSTEMS
LOG OUT

Home | Status | Analysis | Control | Configuration | My Configuration
Wednesday, 24 February 2010 01:38 AM

Classes | Groups

- HA Proxy 10 21
- Linux 6
- OpSource_Cloud 1 13
 - HOST 1 13
 - 10.162.124.11 7
 - DISK 2
 - rule 5
 - 10.162.124.12 1 6
 - DISK 2
 - rule 1 4
 - check_load
 - check_mailq
 - check_memory
 - check_swap
 - server_status
- Tapin 2
- Windows 1 5
 - Hostname 1 5
 - PLOH-PC1 1 5
 - Component 2
 - CPU 1
 - DISK 1 2

Events | **Graphs**

pct Max 8.25 Avg 7.22 Min 5.40

pct Max nan Avg nan Min nan

pct Max nan Avg nan Min nan

check_memory

▲ Sev 1 ■ Sev 2 ■ Sev 3 ■ Sev 4 ■ Sev 5

Metric values

TIME	SEVERITY	PCT
February 24, 2010 02:20:02 AM	1	5.40
February 24, 2010 02:15:02 AM	1	5.40
February 24, 2010 02:10:01 AM	1	5.50
February 24, 2010 02:05:02 AM	1	6.90
February 24, 2010 02:00:02 AM	1	6.90
February 24, 2010 01:55:01 AM	1	7.30
February 24, 2010 01:50:02 AM	1	7.40

Attribute	Value
Object	check_memory
Class	OpSource_Cloud

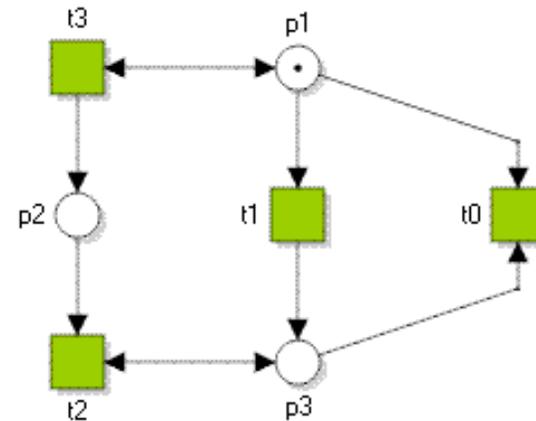
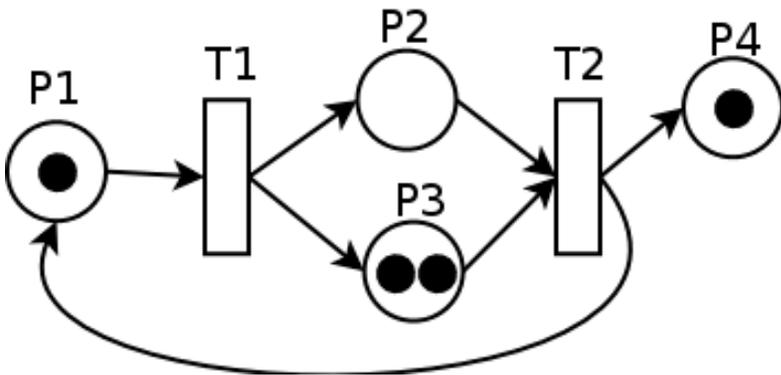
© 2008 - 2009 Tap In Systems. All rights reserved.

Tap In – Control Plan Editor

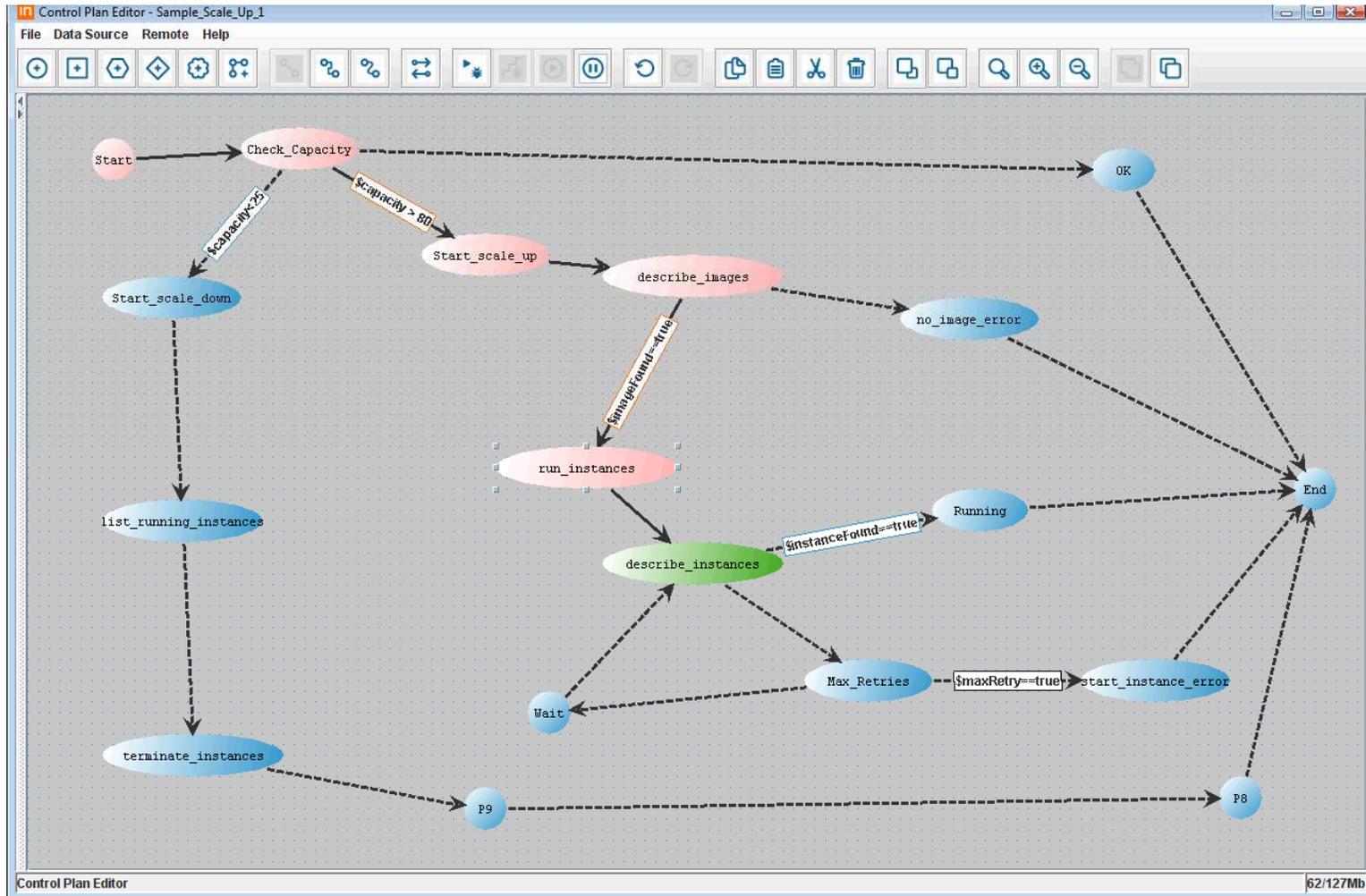
- Tool to graphically **model** IT business process
- Uses generic **Petri Net** modelling technique
- Can be used to automate:
 - Application recovery
 - Auto-scaling compute load
 - Storage automation
 - Application service level management
 - Disaster recovery
 - Cross vendor cloud automation
 - Hybrid application automation
 - Problem ticketing

Petri Net Models

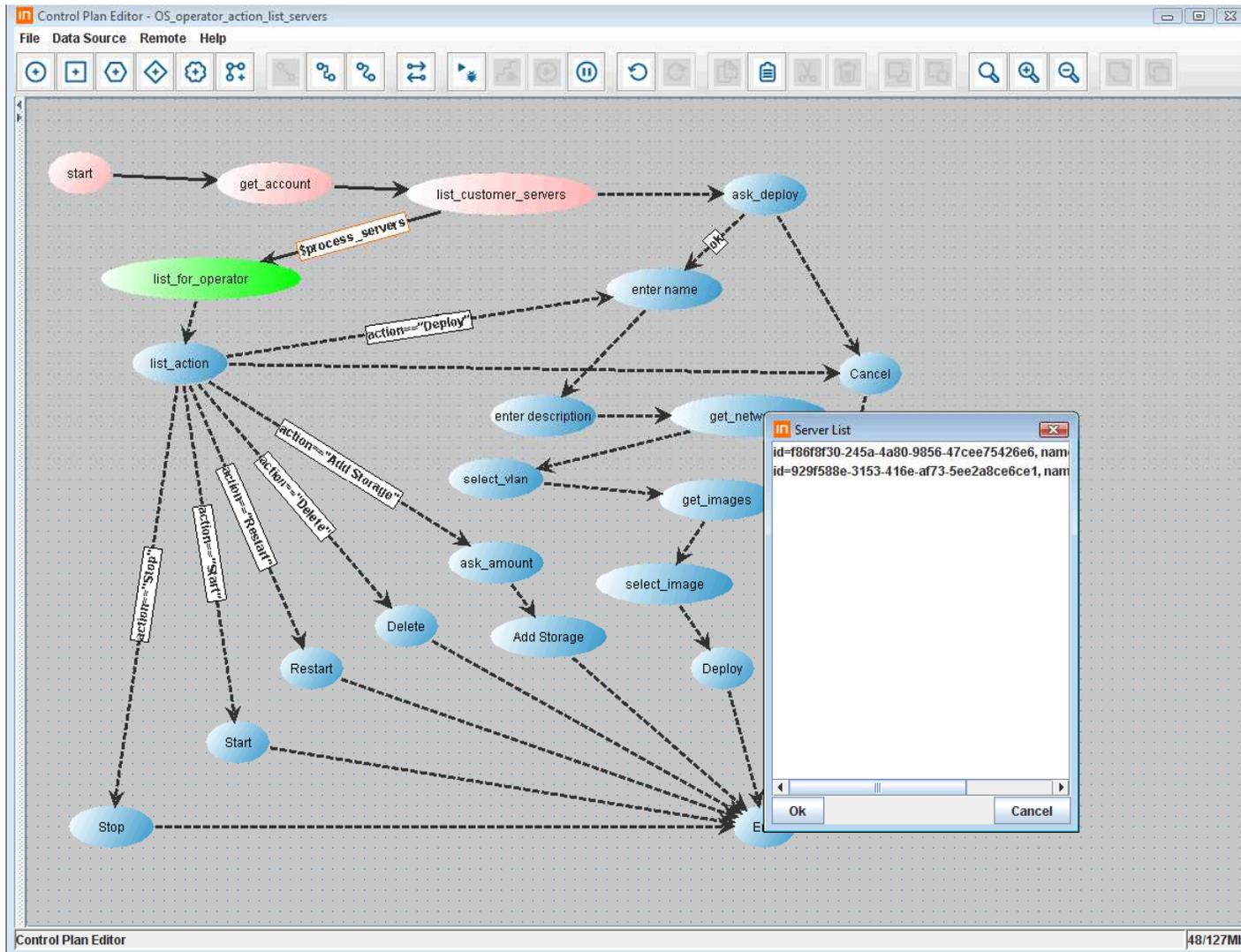
- What are Petri Nets?
 - Petri Nets are a graphical formalism for systems specifications
 - Used to describe processes and workflow
- Petri Nets are formed from finite sets of
 - *Places, Transitions, Arrows* - connecting either places to transitions or transitions to places
- A Petri Net (PN) is given a *state* by *marking* its places with *tokens*



Example – Autoscaling Model



Example – OpSource Semi-Automated Provisioning



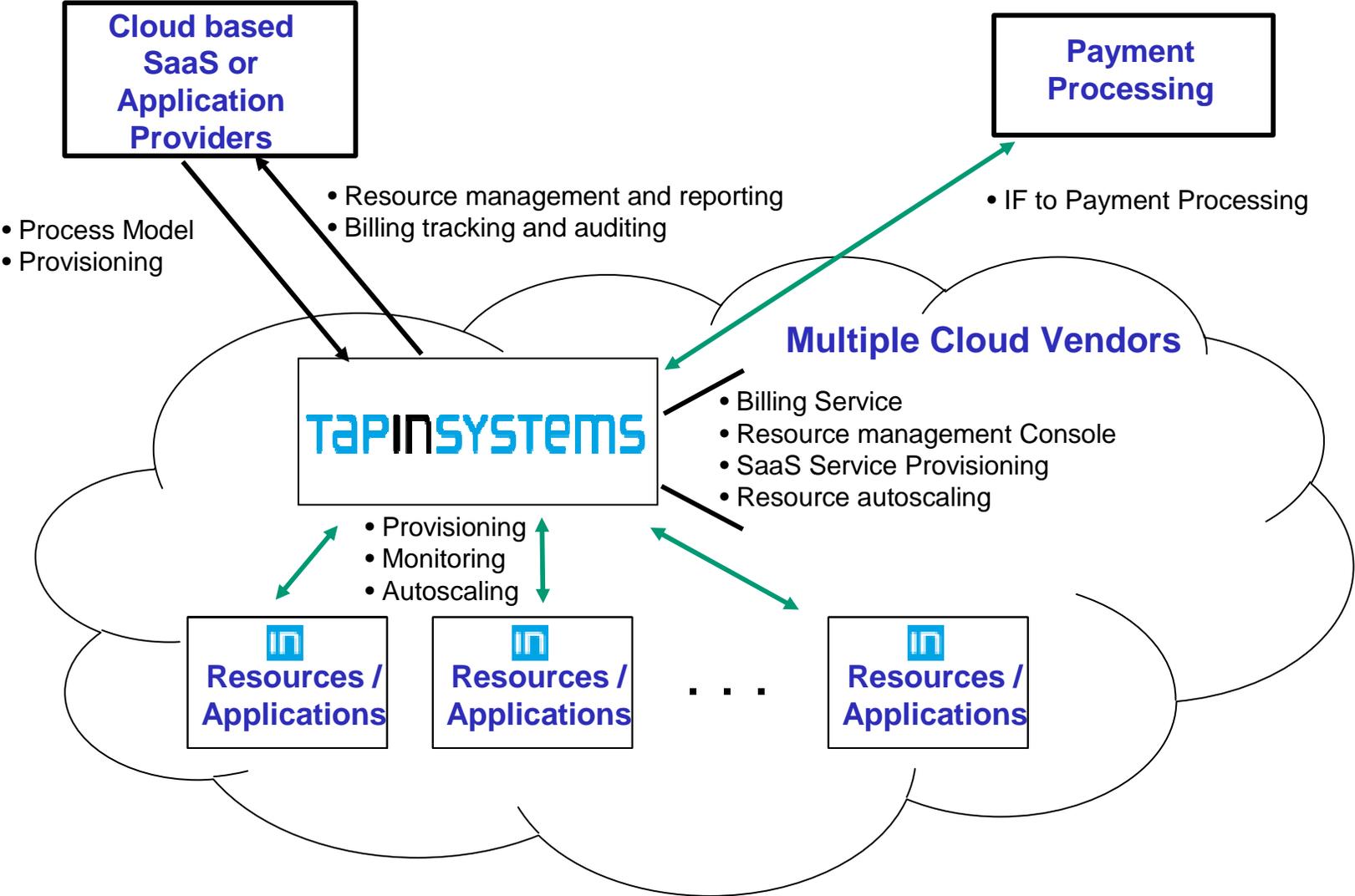
Control Plan Benefits

- Automate complex processes using Petri Nets
 - Graphical modelling of customer operations
 - Modelling is independent of programming!
 - Eases development and maintenance cost
- Create services offerings based on cloud services
 - Library of automation tasks/best practices
 - Leverage use of cloud services
 - Make use of cloud services more efficient

Cloud Provisioning

- Automatically provision cloud applications using cloud vendor APIs
- Customer can build provisioning processes using Tap In modeling and automation tools
- Support for multiple cloud vendors
- Supports provisioning across multiple cloud vendor services
- Integrate processes with credit card payment services
- Supports automatic scaling processes

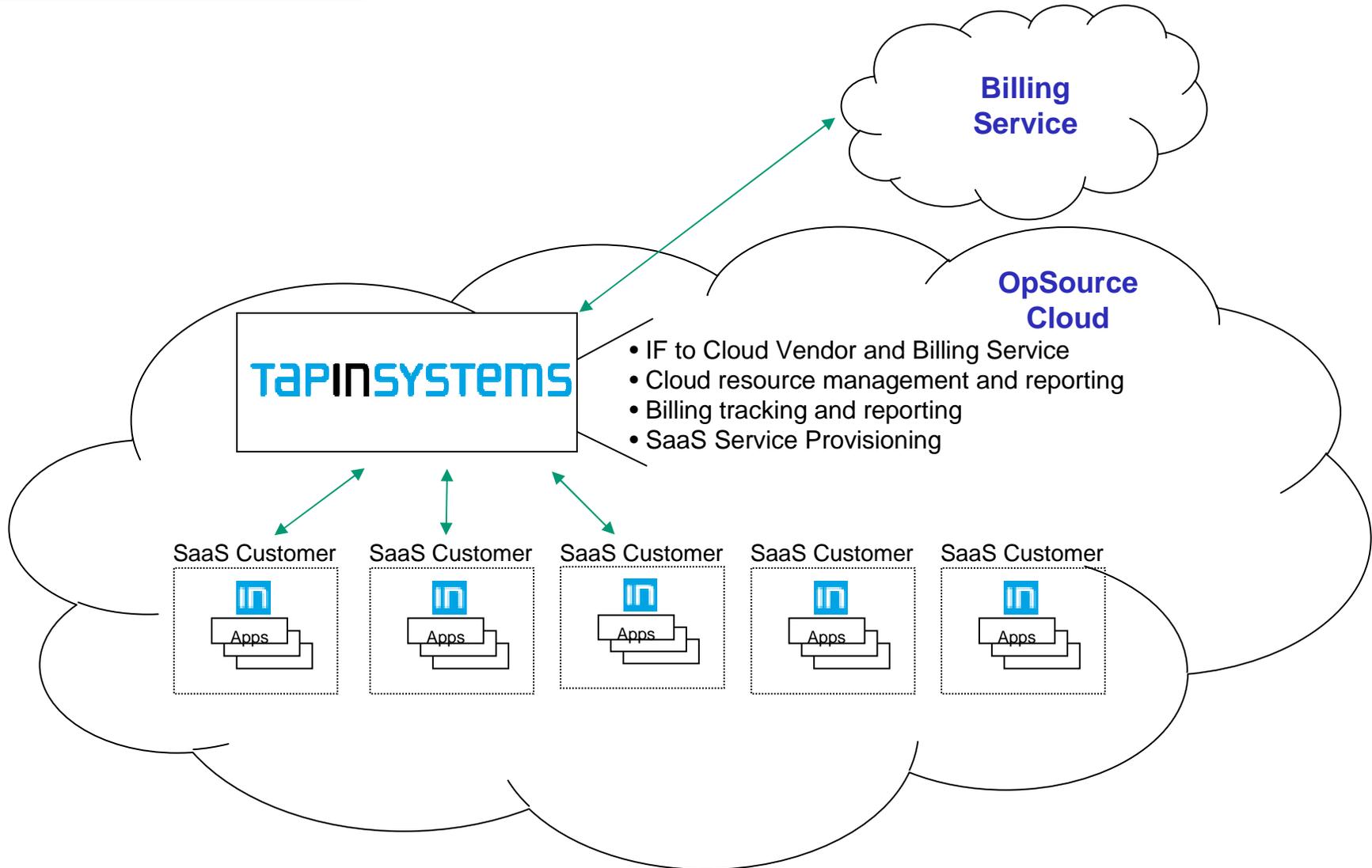
Tap In – Implementation Options



Cloud Auditing

- Service Level Reports
 - Able to implement complex monitoring rules
- Usage reports – based on monitoring metrics
- Billing Reports
 - Optionally linked to payment services
- Performance and capacity graphs
- Configuration and change reports
- Integrate cloud service auditing with corporate policies

Example Customer - SaaS Provider





Peter Loh

ploh@tapinsystems.com

(415) 305-7744

www.tapinsystems.com

TAPINSYSTEMS

TAPINSYSTEMS