

Licensing (Enforcement & Compliance) Update

Tu Le – Product Management

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Agenda

- Business Challenges and Market Trends
 - Virtualization
 - Cloud Computing
- FlexNet Licensing Release Overview
 - FlexNet Publisher 11.10
 - FlexNet Embedded 4.1
- FlexNet Publisher Component and Compiler Updates
- Roadmap Discussion
- Q&A

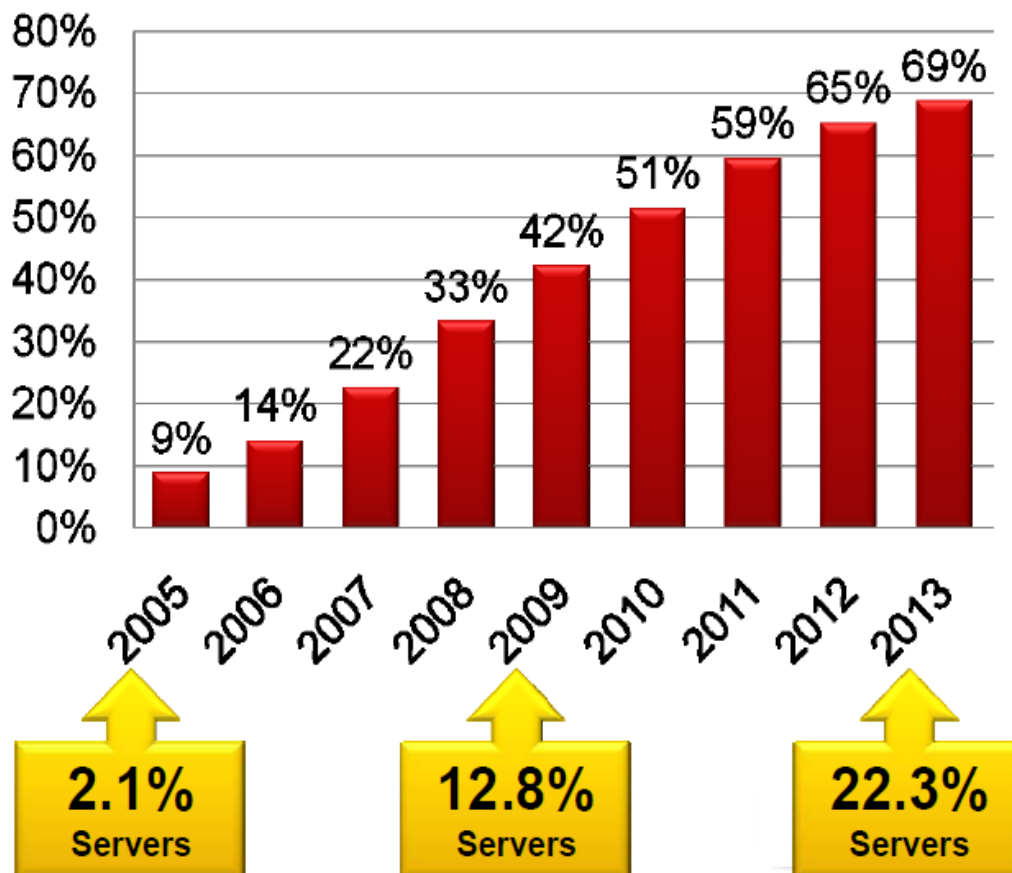
Business Challenges and Market Trends

Virtualization: Growing Rapidly

In 2010, 51% of server workloads were virtualized.

- “Virtualization First” for 75% of customers
- More than half of all workloads (51%) will be virtualized by the end of 2010
 - Two-thirds (69%) by 2013
- Only 12.8% of all physical servers are virtualized in 2009
- VM densities continue to rise predictably, averaging 6 VM’s per physical server in 2009 and 8.4 in 2013

WW Installed Workloads Virtualized by Year



Sources: IDC (2010)

Virtualization: Going Mainstream

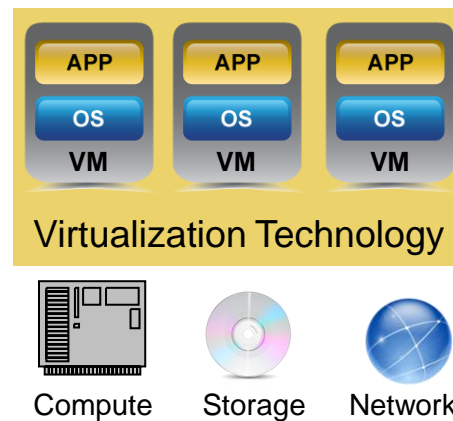
- Virtualization is mainstream but Publishers are slow to react
 - 71% of Publishers believe that Customers use VMs (IDC 2010)
 - 36% of Publishers want to use virtual appliances (IDC 2010)
- Approaches
 - Detect and deny
 - Bind to a VM identifier
 - Bind to an external identifier on a non-virtual component
- The requirements
 - Detection, binding, hardware binding (bare-metal)
- The complexity
 - We've identified 37 different VM technologies
 - It's bound to get simpler...

Cloud Computing

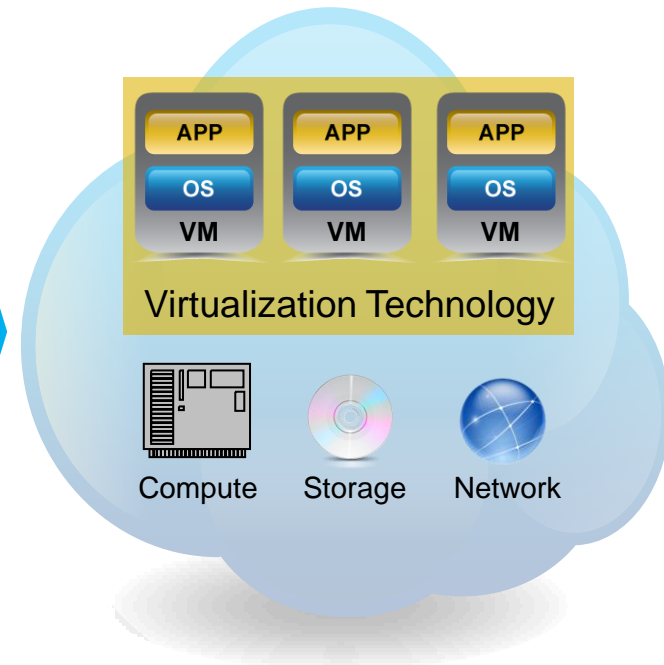
Traditionally, enterprises deployed software on physical hardware with lots of under-utilized hardware



Increasingly, enterprises deploy software on virtual machines on-premises to consolidate hardware leading to reduced hardware spend and administration costs



Public Cloud Providers (e.g. Amazon) use virtualization to automate and dramatically accelerate hardware and software provisioning



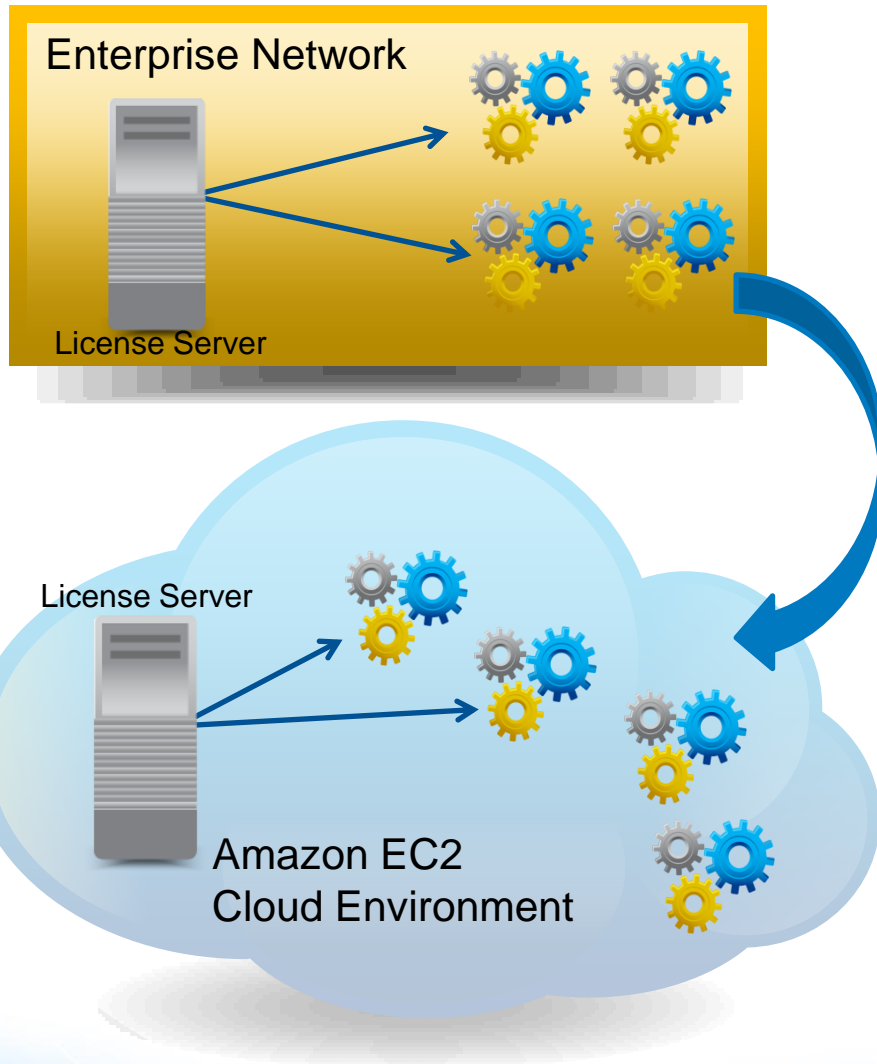
The global cloud computing market to reach \$241 billion in 2020 compared to \$40.7 billion in 2010 – Forrester Research

FlexNet Publisher 11.10 (GA: July 29, 2011) Release Overview

FlexNet Publisher: Amazon EC2 license models

Available only for FlexNet Publisher certificate licenses

License server based license models



Features

- “**Business as usual**” Amazon EC2 business models:
 - License server based models
 - Bind to Amazon Elastic IP address (EIP)
 - Standalone software locked to Amazon Instance ID

Benefits

- Allow software producers to grow revenues through existing and new license models in Amazon EC2

Licensing in Amazon EC2 Cloud: “Business As Usual” with Served Licensing

- Bind the License Server to the Amazon Elastic IP (EIP) address
 - EIP is just like a static IP address
 - Can be re-assigned on the fly to any running AMI instance
- Syntax:
 - *SERVER this_host* **AMZN_EIP=184.72.45.35**
 - Only IPv4 address supported (Amazon restriction)
 - Only supported for license server (i.e. not for node-locking the client application)
- Extract the EIP by typing:
 - *% Imhostid -eip -ptype AMZN* OR
 - From Amazon EC2 infrastructure
- Advantages:
 - If a license server instance goes down, bring up the server on a different AMI instance and reassign the EIP
 - Can move from Windows to Linux
 - Don't need 3-server redundancy
 - This process can be automated with AWS (Web Services) or 3rd party tools

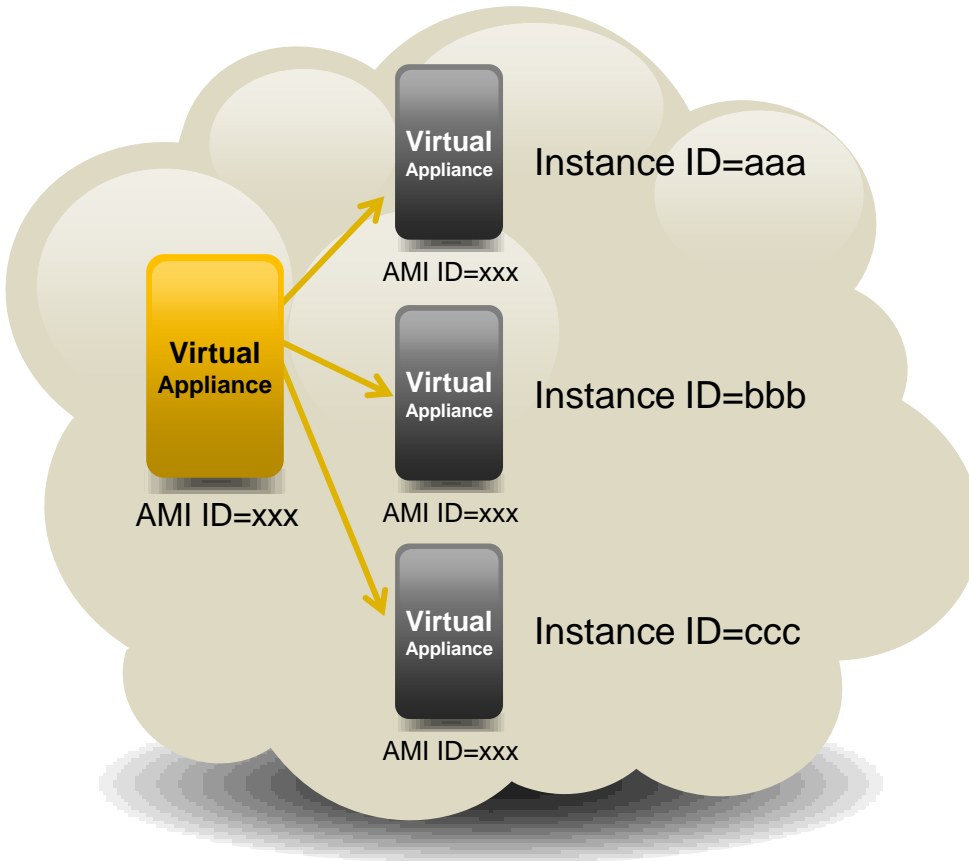
Licensing in Amazon EC2 Cloud: “Business As Usual” with Node Locked Licensing

- Bind the FlexEnabled application to the AMI Instance ID
 - AMI Instance ID is like a VM UUID/VMID
 - Will survive Start/Stop/Reboot cycle, but not termination
- Syntax:
 - *INCREMENT F1 demo ... HOSTID=AMZN_IID=i-51e04315 .. SIGN=xxx*
 - Only supported for license client (i.e. not on SERVER line)
- Extract the AMI ID by typing:
 - *% Imhostid -iid -ptype AMZN* OR
 - From Amazon EC2 infrastructure
- Notes:
 - If you terminate an AMI instance, you will need to re-obtain the license (re-hosting event)
 - No cross-version signatures, so can't support legacy clients with this license

FlexNet Publisher: Amazon EC2 license models (cont)

Available only for FlexNet Publisher certificate licenses

Lease license models via virtual appliance



Features

• Bursts of Use/Pay by the Hour-

- Bind virtual appliances to Amazon Machine Identifier (AMID). Compatible with Amazon DevPay or similar schemes
- For feature-level usage tracking- FlexNet Manager-EA

Benefits

- Quickly rent or lease out pre-configured software application to help grow revenues by leveraging cloud technology

FlexNet Publisher – Features supporting Virtualization technologies

FlexNet Publisher: Virtualization-aware Activation and Trusted Storage

ASR (trial) support

```
<DataDictionary>
  <Entries>
    <Entry>
      <Key>PUBLISHER_DEFINED_CRITERION</Key>
      <Value>LOCAL_ALWAYS</Value>
    </Entry>
    <Entry>
      <Key>PUBLISHER_DEFINED_DURATION</Key>
      <Value>2592000</Value>
    </Entry>
    <Entry>
      <Key>VIRTUALIZATION_POLICY</Key>
      <Value>PHYSICAL, VM_ONLY</Value>
    </Entry>
  </Entries>
</DataDictionary>
```

Detect and Report

```
<Virtualization>
  <Host>
    <Family>MICROSOFT</Family>
    <Name>HYPERV</Name>
    <Vmid>047FCA87F921BB66424DA2B2325...</Vmid>
  </Host>
</Virtualization>
```

- **Family**: Hypervisor Provider: MICROSOFT; VMWARE; UNKNOWN
- **Name** : Specific Hypervisor: HYPERV; VIRTUALPC; VMWARE; UNKNOWN

Features

- Requires Composite Transactions (Activation v2)
- Configure **trials** to be allowed/denied in virtual environments
- Configure **license model policy** to allow (or deny) activation of standalone products or served licenses in virtualized environments
- Standalone software and served licenses can be bound to a fingerprint that includes the virtual machine's UUID
- Activation API to detect VM and stop sending an activation request

ported on VMware and Hyper-V

software producers to prevent revenue or products in a virtual environment

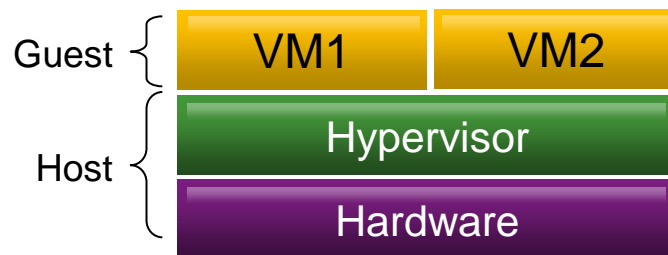
Note: FlexNet Publisher Certificate Style has been supporting VMware and Hyper-V based models since 2010

The Virtualization Stack: Two types of hypervisors

- Definitions

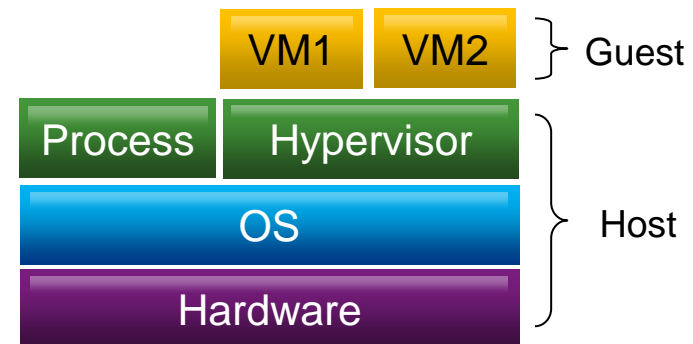
- **Hypervisor** (or **VMM** – Virtual Machine Monitor) is a software layer that allows several **virtual machines** to **run** on a **physical machine**
- The physical OS and hardware are called the **Host**
- The virtual machine OS and applications are called the **Guest**

Type 1 (bare-metal)



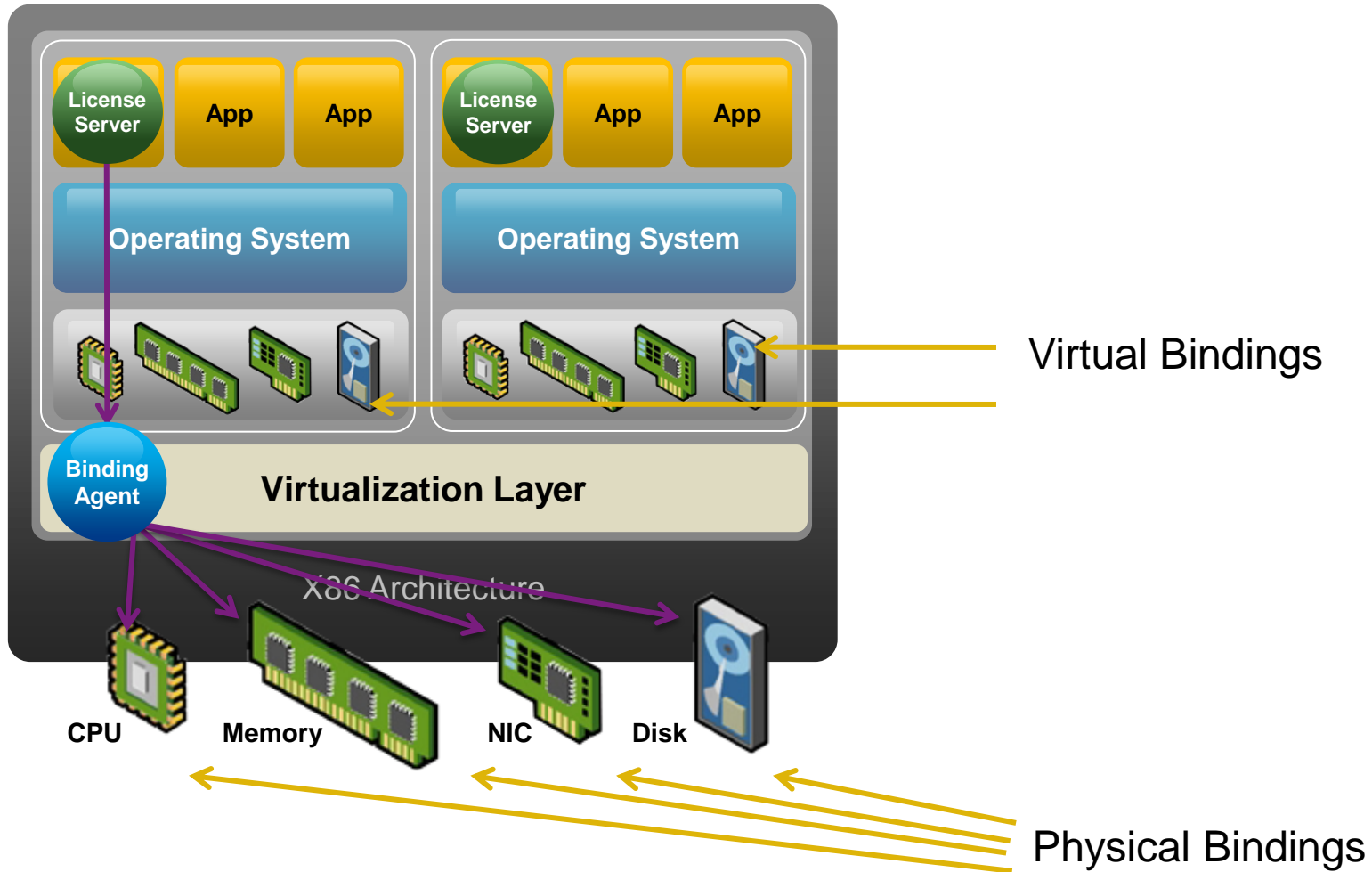
VMware ESX, Microsoft Hyper-V, Xen

Type 2 (hosted)



VMware Workstation, Microsoft Virtual PC, Sun VirtualBox, QEMU, KVM

FlexNet Publisher: Binding options



Virtualization Capabilities

FlexNet Publisher Licensing technology	Soft binding	Hardware binding	Comments
Certificate – node locked licenses	Not supported	Not supported	
Certificate – served licenses	<ul style="list-style-type: none"> • VMware ESX/ESXi • Microsoft Hyper-V 	Supported: <ul style="list-style-type: none"> • Imbind installed on VMware ESX console os • Imbind installed on Microsoft Hyper-V host • Imbind installed on a standalone machine 	Where an admin console is not available on the Hypervisor (e.g. VMWare ESXi), install Imbind on a stand-alone machine.
Trusted Storage – node-locked licenses	<ul style="list-style-type: none"> • VMware ESX/ESXi • Microsoft Hyper-V 	Not supported	Alternatively, use the API to not send activation request on a VM
Trusted Storage – served licenses	<ul style="list-style-type: none"> • VMware ESX/ESXi • Microsoft Hyper-V 	Not supported	Alternatively, use the API to not send activation request on a VM

Tamper Resistant Applications (Secure Data Types)

- Making Tamper Resistant Applications (TRA) easier to use and now supported with FlexNet Publisher certificate licenses
 - A secure data type is a data type (normally an integer) tied to the checkout action
 - Attempting to use SDTs in the absence of a checkout results in non-arithmetic behaviour (random results)
 - SDTs are therefore a protection against patching the checkout call in FlexEnabled applications
- A design aim of SDTs: Avoid binary decision points when protecting an application's licensing

```
#if !defined( SDT_DEFS_H_INCLUDED )
#define SDT_DEFS_H_INCLUDED

#include "fnpsdtapi.h"

SDT_FEATURE_DEFINE( "ADD", 0, FeatureAdd );
SDT_FEATURE_DEFINE( "SUBTRACT", 1, FeatureSubtract );
SDT_FEATURE_DEFINE( "MULTIPLY", 2, FeatureMultiply );
SDT_FEATURE_DEFINE( "DIVIDE", 3, FeatureDivide );
SDT_FEATURE_DEFINE( "POWER", 4, FeaturePower );
SDT_FEATURE_DEFINE( "AVG", 5, FeatureAvg );

#endif /* !defined( SDT_DEFS_H_INCLUDED ) */

SDT_FEATURE_IMPLEMENT_BEGIN()
    SDT_FEATURE_IMPLEMENT_C( FeatureAdd, "ADD" )
    SDT_FEATURE_IMPLEMENT_C( FeatureSubtract, "SUBTRACT" )
    SDT_FEATURE_IMPLEMENT_C( FeatureMultiply, "MULTIPLY" )
    SDT_FEATURE_IMPLEMENT_C( FeatureDivide, "DIVIDE" )
    SDT_FEATURE_IMPLEMENT_C( FeaturePower, "POWER" )
    SDT_FEATURE_IMPLEMENT_C( FeatureAvg, "AVG" )
SDT_FEATURE_IMPLEMENT_END()

case ADD: /* currentValue = currentValue + enteredValue; */
    case ADD_NO_CHECKOUT:
    {
        SDT_FEATURE_DECLARE_VAR( FeatureAdd, current );
        SDT_FEATURE_DECLARE_VAR( FeatureAdd, entered );

        printf("operation : %d + %d = ", currentValue, enteredValue);

        SDT_FEATURE_SET( current, currentValue );
        SDT_FEATURE_SET( entered, enteredValue );

        SDT_FEATURE_ADD( current, entered );

        currentValue = SDT_FEATURE_GET( current );

        printf("%d\n", currentValue);
    }
    break;
```

Note: FlexNet Publisher Trusted Storage has been supporting TRA since 2005

Additional Features in 11.10

- Support for Microsoft Active Directory in Imadmin enabling secure administration of the license server
- Enhancement to Imbind to be installed on a standard Windows or Linux operating system
 - previously, it was required to be run on the console OS of a VM
- Newly supported platforms:
 - Red Hat Enterprise Linux Server (RHEL) version 6
 - SUSE Linux Enterprise Server version 11
 - IBM AIX 6.1

FlexNet Embedded 4.1 (GA: August 18, 2011) Release Overview

FlexNet Embedded: Virtualization Support

Capability Request

Server Type: FNE Device Manager Auto

HostID: 00-A3-FF-DE-E1-FF

Feature: highres Count: 3

Request

Features

- Configure license model policy to allow (or deny) provisioning of devices or license servers in virtualized environments
- Devices and license servers can be bound to virtual machine UUID
- Monitor and track devices or license server in a virtual environment







Benefits

- Support business models based on virtual appliances
- Quickly identify virtualization candidates to ensure Enterprise is in compliance with software licensing terms

Devices

Search (cas

Devices with features consumed or reserved. Click a device ID for further details.

Device ID	Device Alias	Device Type	Consumed Features
 00-6C-3D-98-C4-59	VM-SRVR4	VMWare	lowres (10)
 00-8C-1B-47-37-23	VM-WRKSLAB3	Hyper-V	survey (7)
 00-A3-FF-DE-E1-FF	VM-WEB SRVR5	VMWare	highres (3)
 A0-B1-34-FF-FF-22	SCL7-SWONSER	PHYSICAL	highres (2), lowres (5), surve...
 C0-A0-38-9B-8F-DB	SCL7-EJOHNSON	PHYSICAL	survey (3)
 F0-B0-11-BB-8F-DB	SCL7-TLE	PHYSICAL	survey (5)

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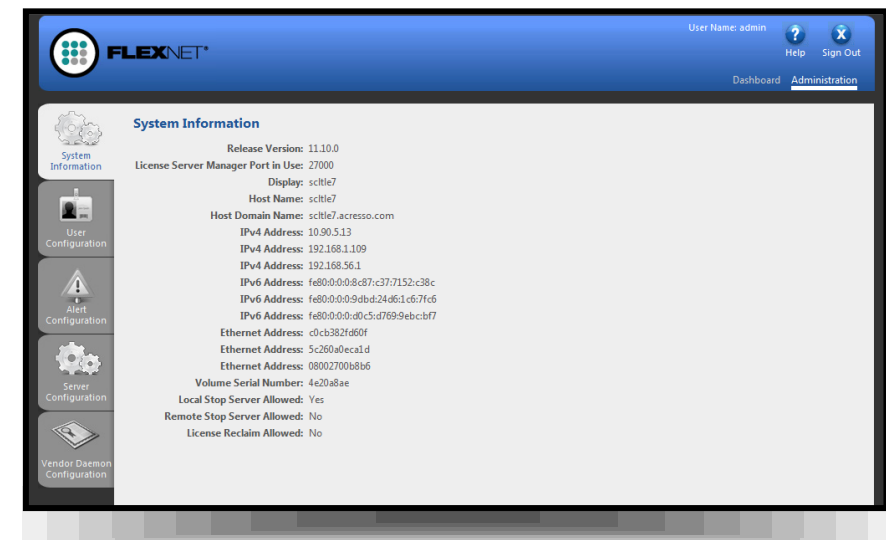
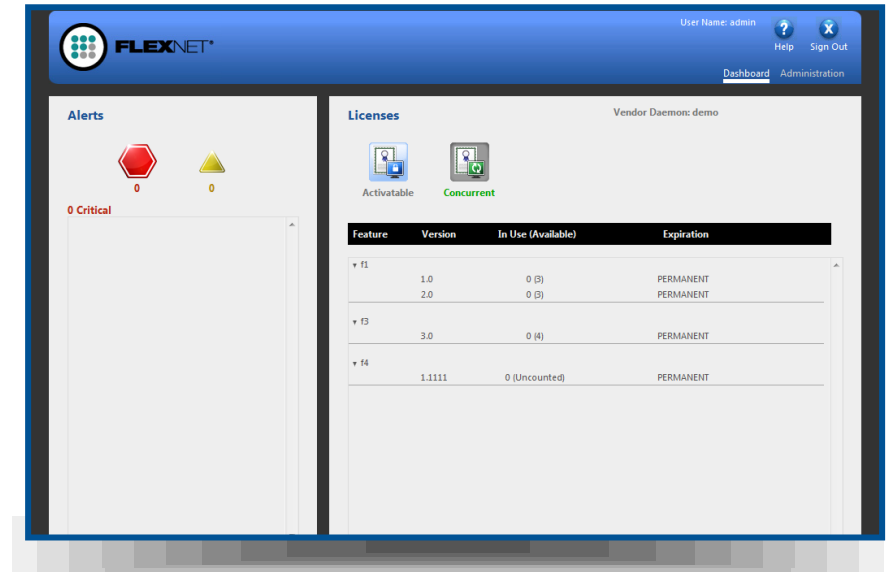
Additional Features

- Platform updates
 - Windows 64-bit on x86
 - Windows CE 32-bit on x86
 - Linux 64-bit on x86
 - IBM AIX 6.1 64-bit on PowerPC
 - Solaris 10 32-bit on x86 and SPARC (end of this month)
 - Solaris 10 64-bit on x86 and SPARC (end of this month)

FlexNet Publisher Component and Compiler Updates

Imgrd End of Life Notification





- Imgrd is targeted to be end of life in September 2013
- Migration path is to move to Imadmin
 - Why: in addition to offering the same functionality as Imgrd, Imadmin has additional new capabilities:
 - An easy-to-use Web-based administrative interface
 - **Support a command line interface (CLI) and ability to support previous CLI tools and utilities for smooth transition**
 - Support for multiple vendor daemons with one Imadmin process
 - Ability to perform all server configuration and administration functions from the browser.
 - Ability to import existing license files
 - Platform enabling future capabilities such as web services for customization
- Imadmin Migration FAQ:
http://www.globes.com/support/fnp-licensing/FNP_FAQ_Imadmin_Apr11.pdf



FlexNet Publisher Platform Updates

- Platform updates:
 - Mac OS X 32-bit on PPC (EOL)
 - Mac OS X 32-bit and 64-bit x86/PPC version 10.4 and lower (EOL)
 - HP-UX 11i v1 and v2 (EOL)
 - Java JVM 1.5 and lower (EOL)
 - Red Hat Enterprise Linux version 4.0 (target to be EOL – Summer 2012)
 - Windows Server 2008 R2 on Intel Itanium (IA-64) will be the last supported Windows version on IA-64
 - Red Hat Enterprise Linux version 5.0 on Intel Itanium (IA-64) will be the last supported Linux support on IA-64
- Virtualization platform updates:
 - VMware ESX 3.5 (EOL)
 - VMware ESXi 3.5 (EOL)
 - VMware Workstation 6.5 (EOL)

Migration Summary

- Imgrd, Imtools  Imadmin
- Mac PPC  Mac x86, x64 (Universal Binary)
- VS 2005  VS 2008, VS 2010
- GCC 3.x compiler  GCC 4.x

Questions?