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ThinManager

Effective management of Thin client architectures

Tomas Knobloch

Solution Architect Visualization, Process, SW

 *Allen-Bradley • Rockwell Software*

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Short intro to Remote Desktop and Thin Client technology

Tomas Knobloch

Solution Architect Visualization, Process, SW

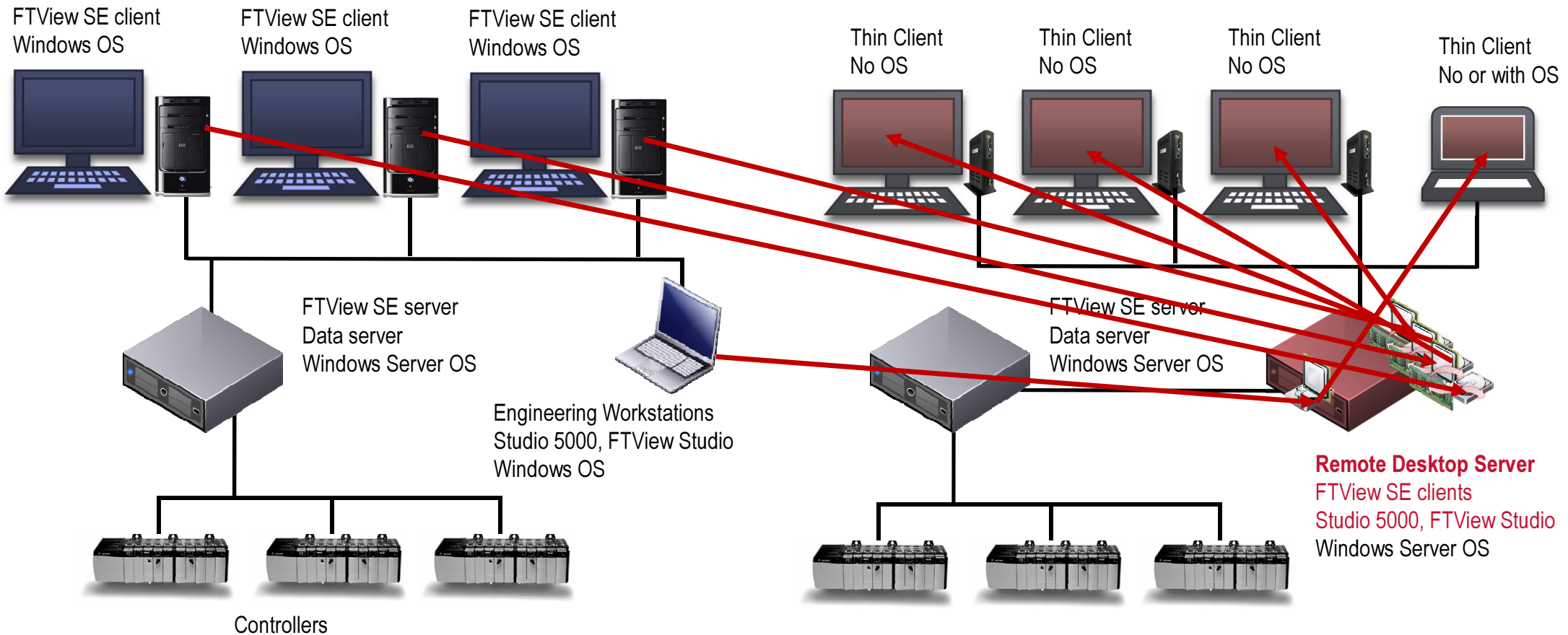
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Principle of Remote desktop (RD)

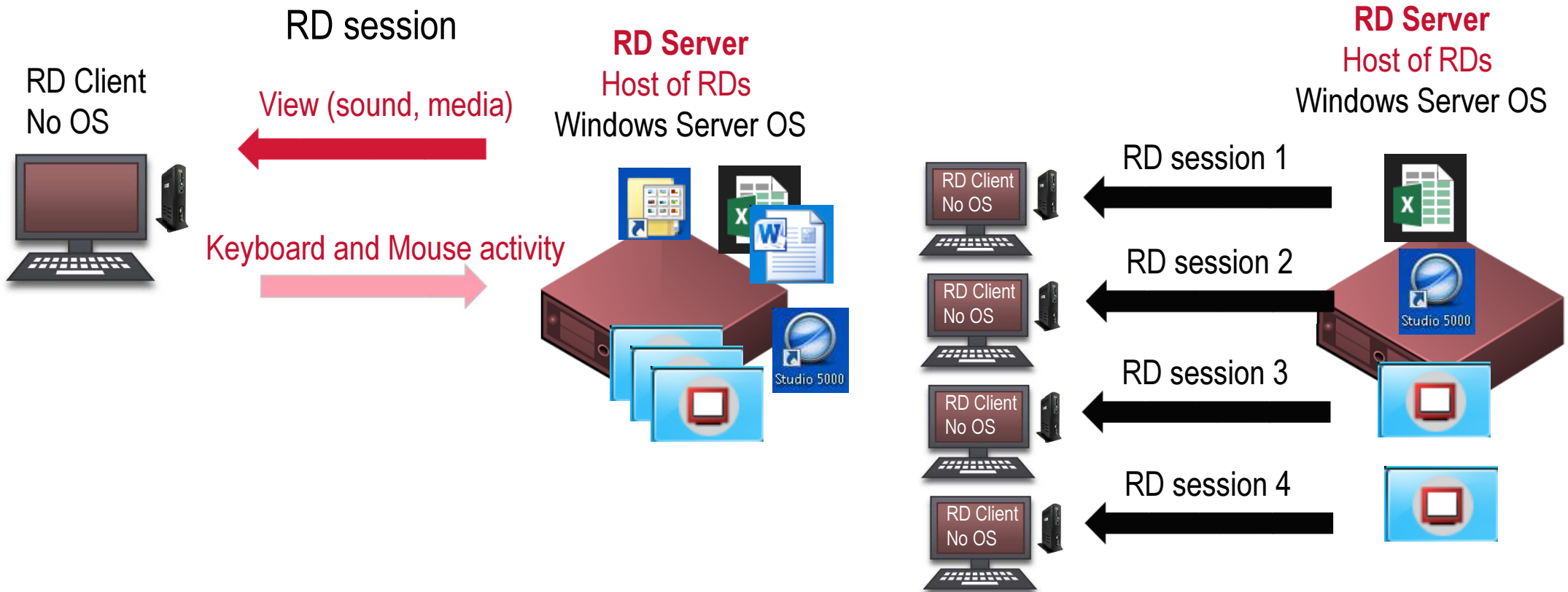
"Standard" versus RD architecture

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Principle of Remote desktop (RD)

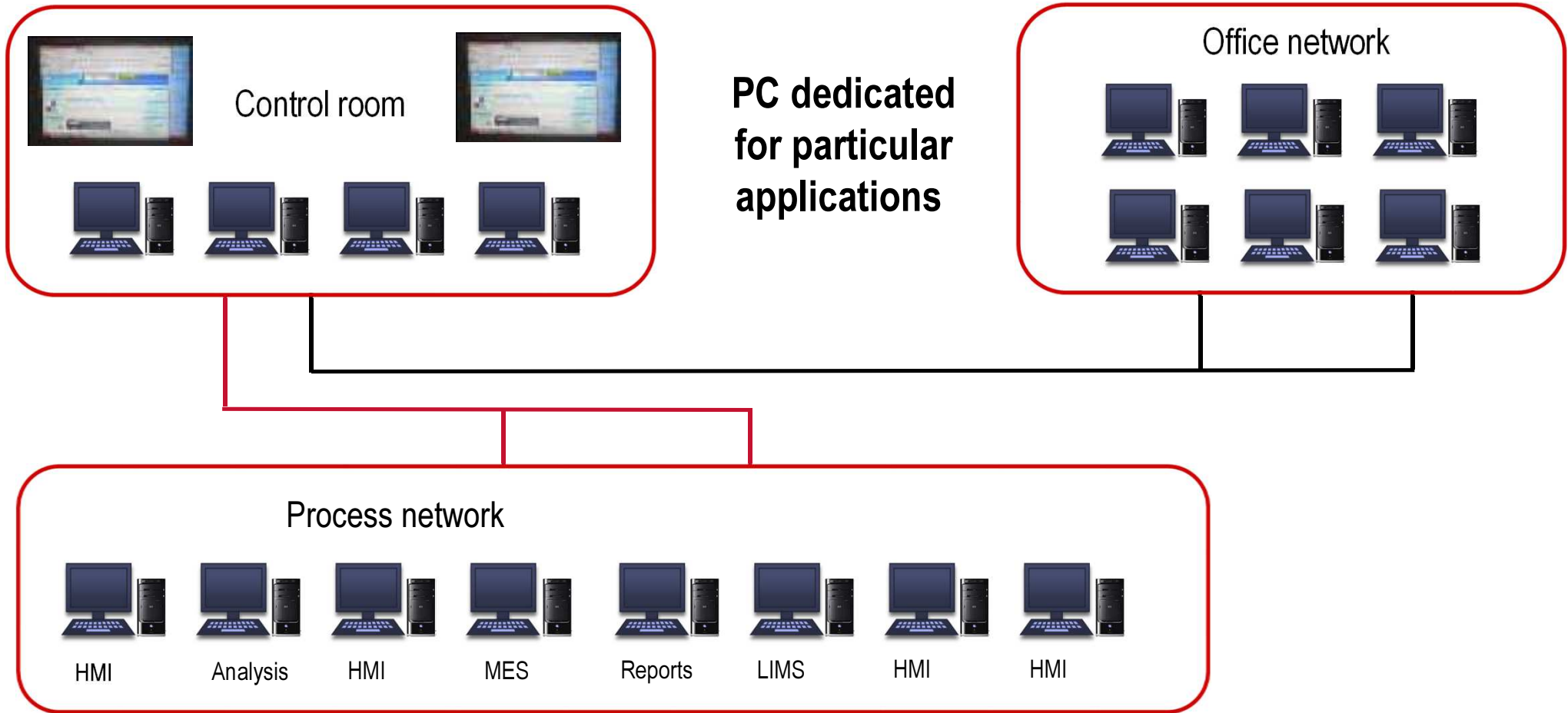
RD sessions



Principle of Remote desktop (RD)

”Standard” versus RD architecture

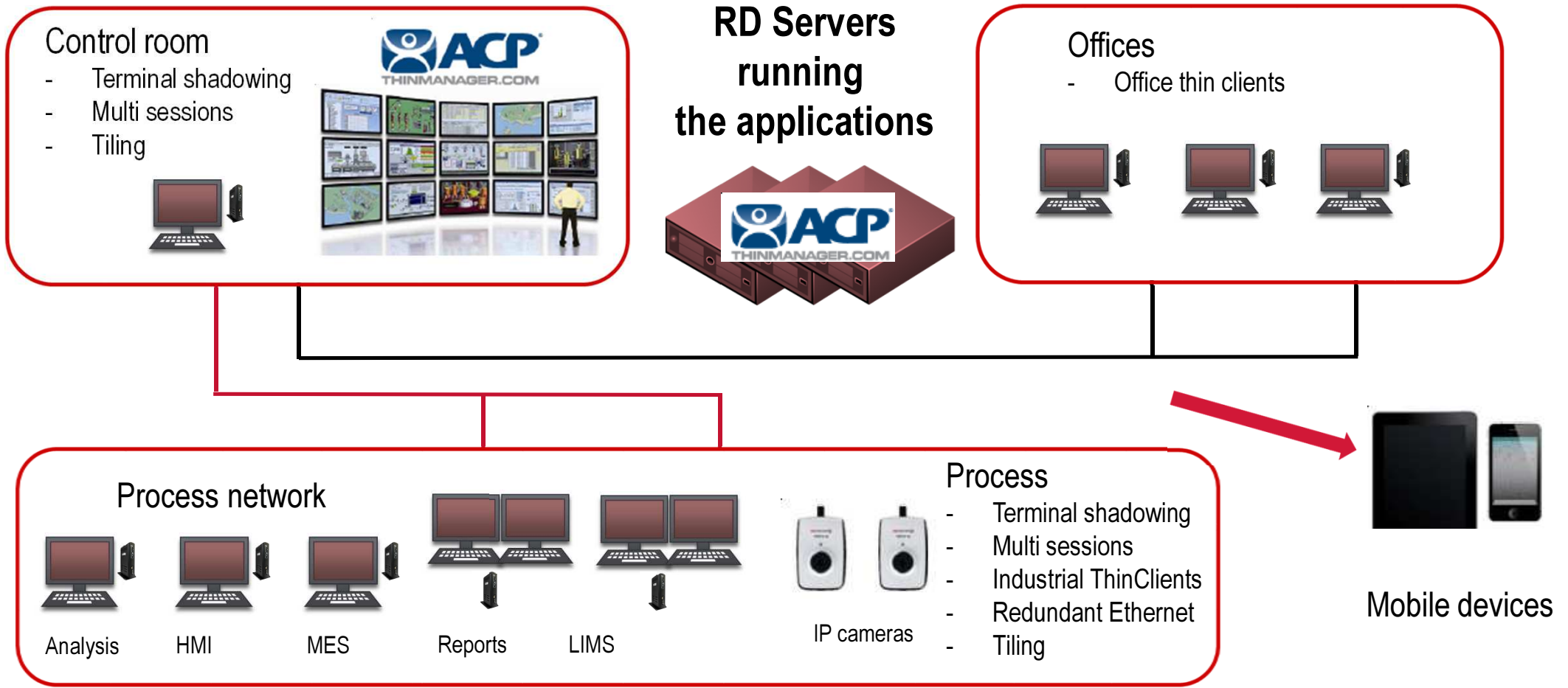
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Principle of Remote desktop (RD)

”Standard” versus RD architecture

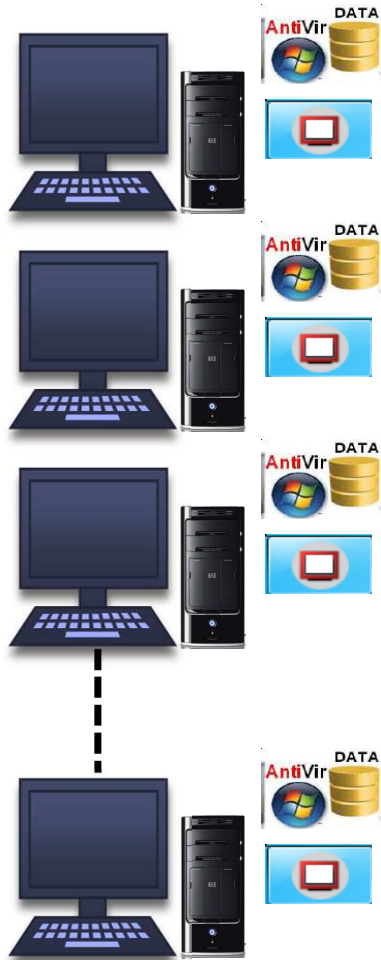
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Transition from “standard solution” to RD+TM

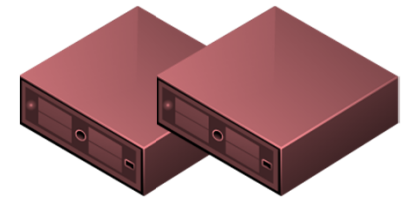
”Standard” versus RD architecture

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Starting point

RD Servers



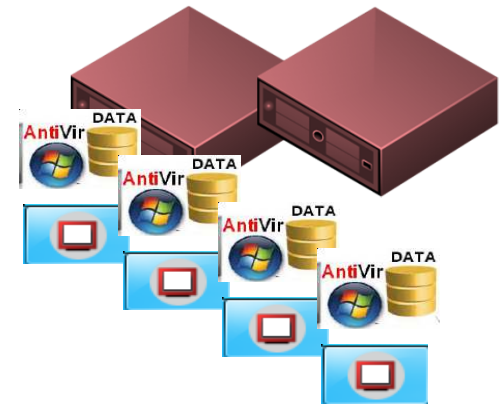
Transition from “standard solution” to RD+™ ”Standard” versus RD architecture

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1. Move the applications to the RD servers
2. Replace PC with Thin client HW (no OS)

RD Servers



Transition from “standard solution” to RD+TM ”Standard” versus RD architecture

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1. Move the applications to the RD servers
2. Replace PC with Thin client HW (no OS)
3. System configuration
4. Operation/Production



RD Servers



Transition from “standard solution” to RD+TM ”Standard” versus RD architecture

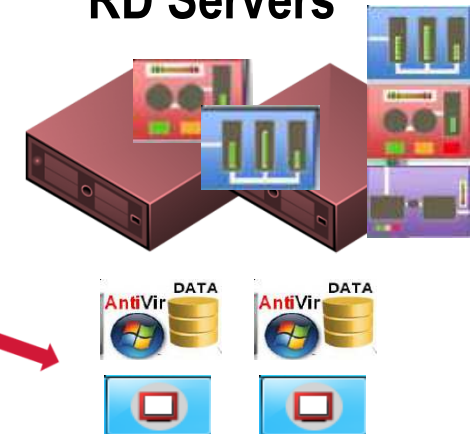
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1. Move the applications to the RD servers
2. Replace PC with Thin client HW (no OS)
3. System configuration
4. Operation/Production
5. SW and HW update on servers only



RD Servers



What is easier to maintain?

”Standard” versus RD architecture

4 x HD + 4 x Fans

2 x OS + Patches

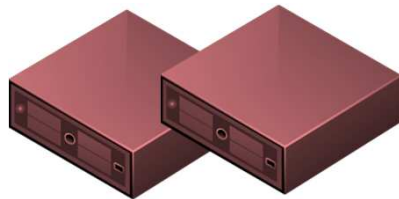
2 x FTVIEW SE Client
or other apps

2 x Administration

Better utilization of CPU
and RAM

Virtualization and High
Availability

2 servers



30 x HD + 60 x Fans
Highest failure rate

30 x OS + Patches

30 x FTVIEW SE Client
or other apps

30 x Administration

Low utilization of CPU
and RAM

Virtualization and High
Availability

30 PCs



What is easier to maintain?

"Standard" versus RD architecture

**30 x HD + 60 x Fans
Highest failure rate**

30 x OS + Patches

**30 x FTView SE Client
or other apps**

30 x Administration

**Low utilization of CPU
and RAM**

**Virtualization and High
Availability**



**4 x lower energy
consumption**

Up to 5 x higher lifetime

**Almost no maintenance
No updates
No Antivirus**

**High security
SW is isolated from the
user**

Very fast replacement

No HD, No fans, No OS, Central administration

30 Thin clients



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ThinManager:

A Better Delivery and Management System

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ThinManager Securely Delivers Content

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Content Types

- HMI
- MES
- CMMS
- ERP
- Web Content
- IP/USB Cameras
- Terminal Shadow
- PanelView Plus

Windows Based

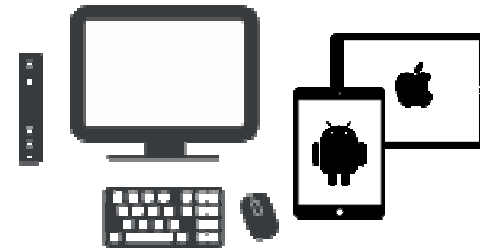
VNC

DELIVER CONNECTED ENTERPRISE CONTENT IN 3 WAYS

By Device

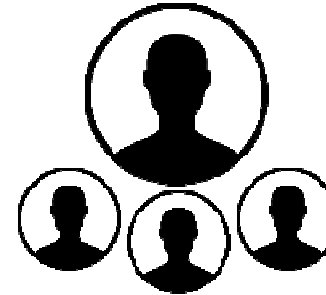
By User

By Location



Devices

- Thin/Zero Clients
- Mobile Devices
- PCs



Users

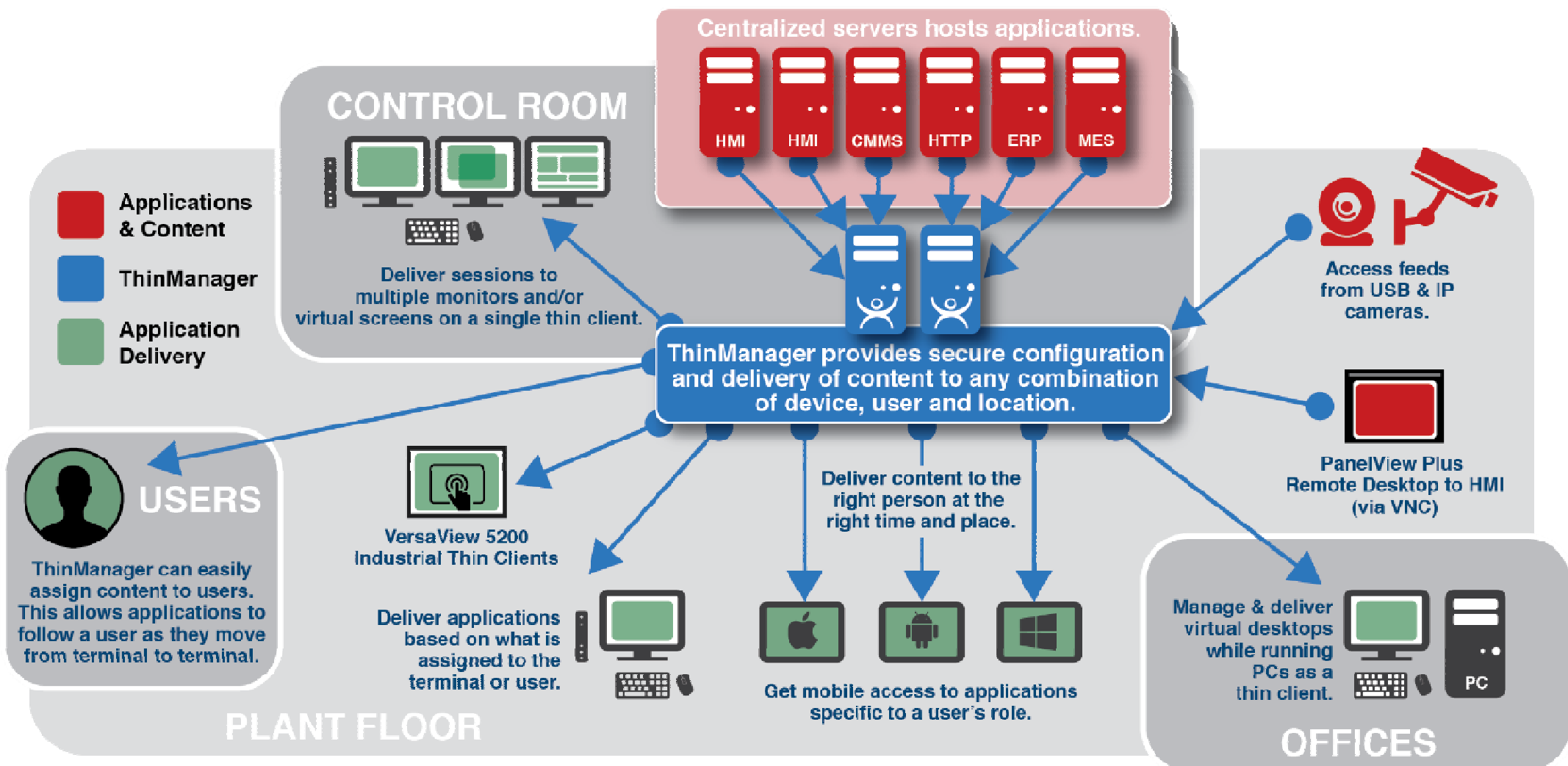
- Individuals
- User Groups



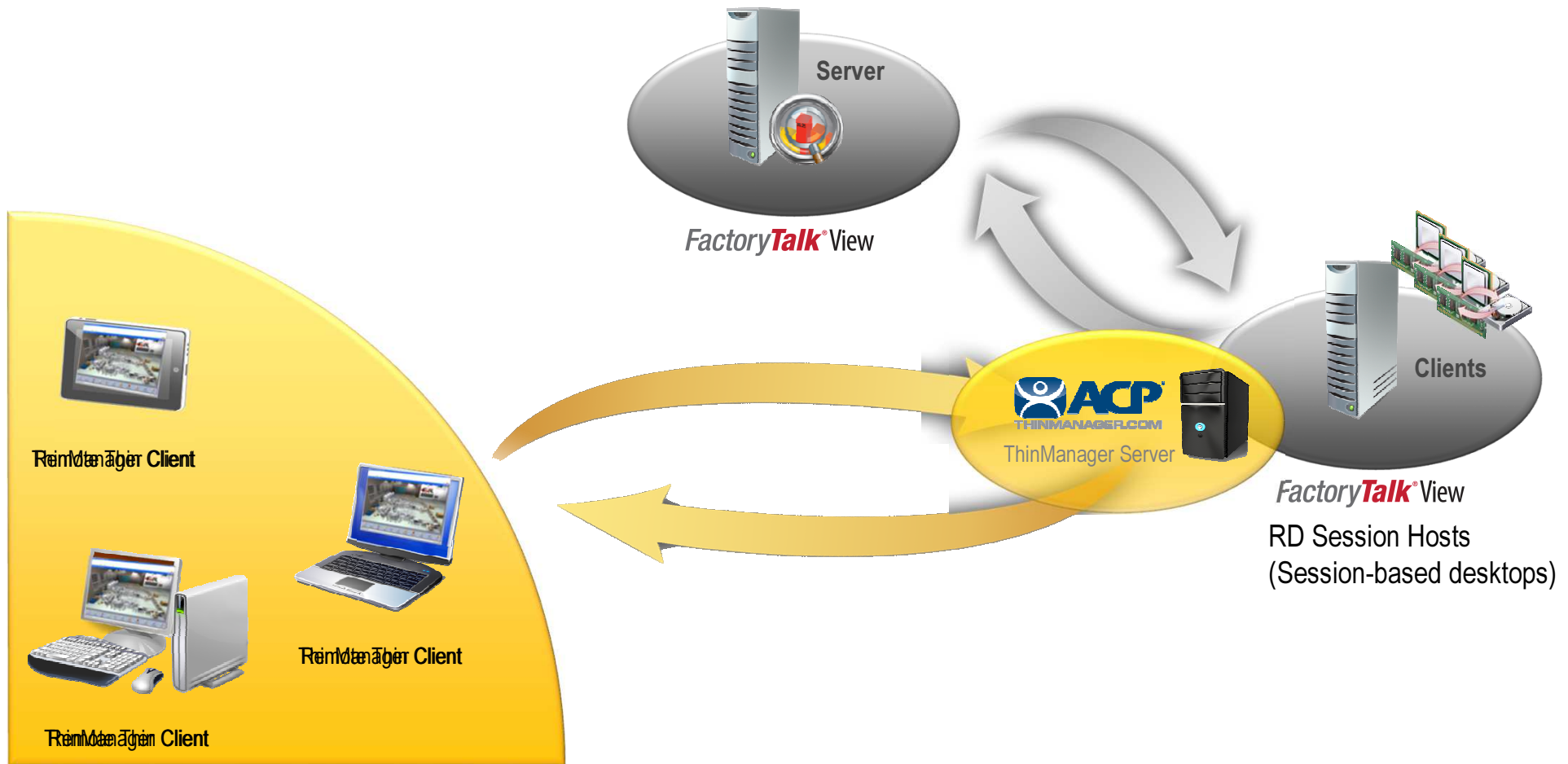
Locations

- Facility
- Lines/Areas
- Assets/Devices

Safely and securely deliver Content to any combination of Device, User and Location.



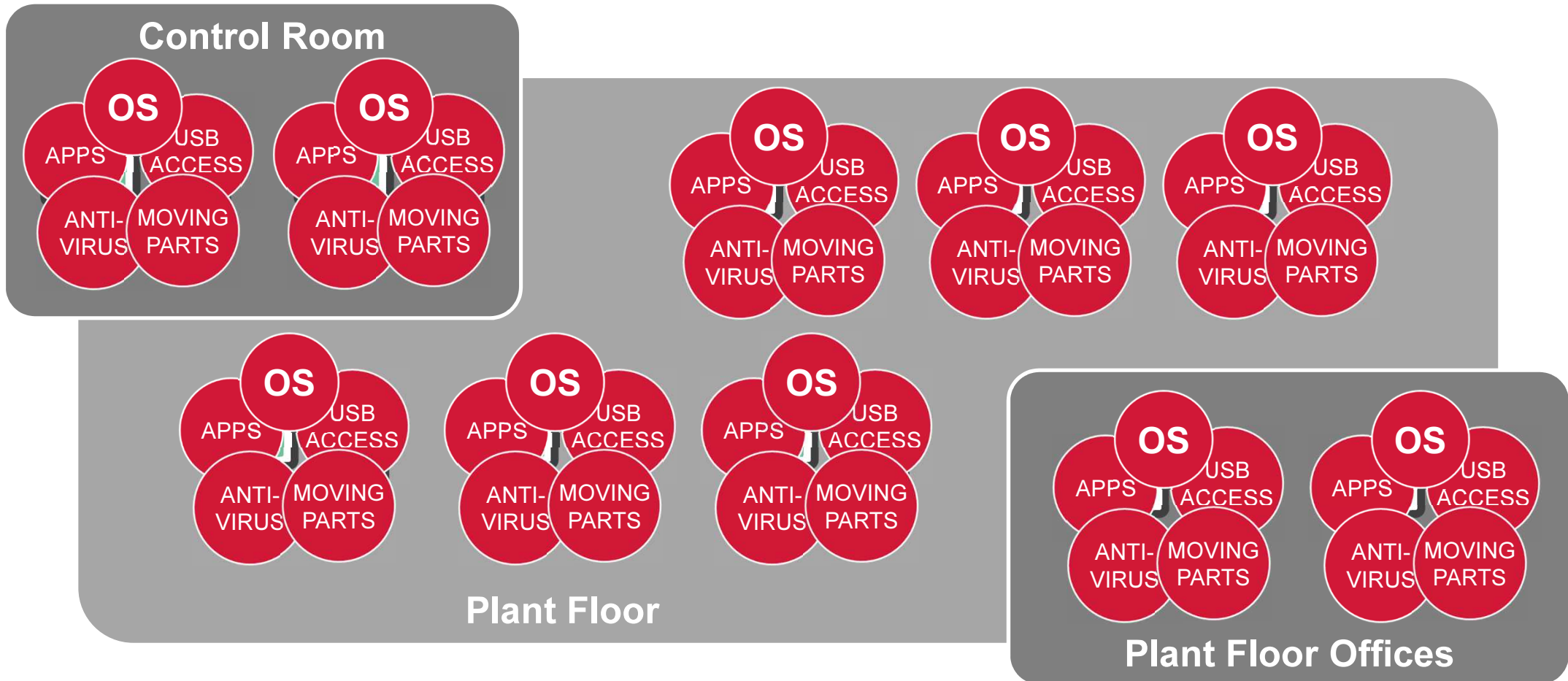
Remote Desktop/Terminal Services Overview



Traditional Automation Network

Dedicated PCs for Dedicated Applications

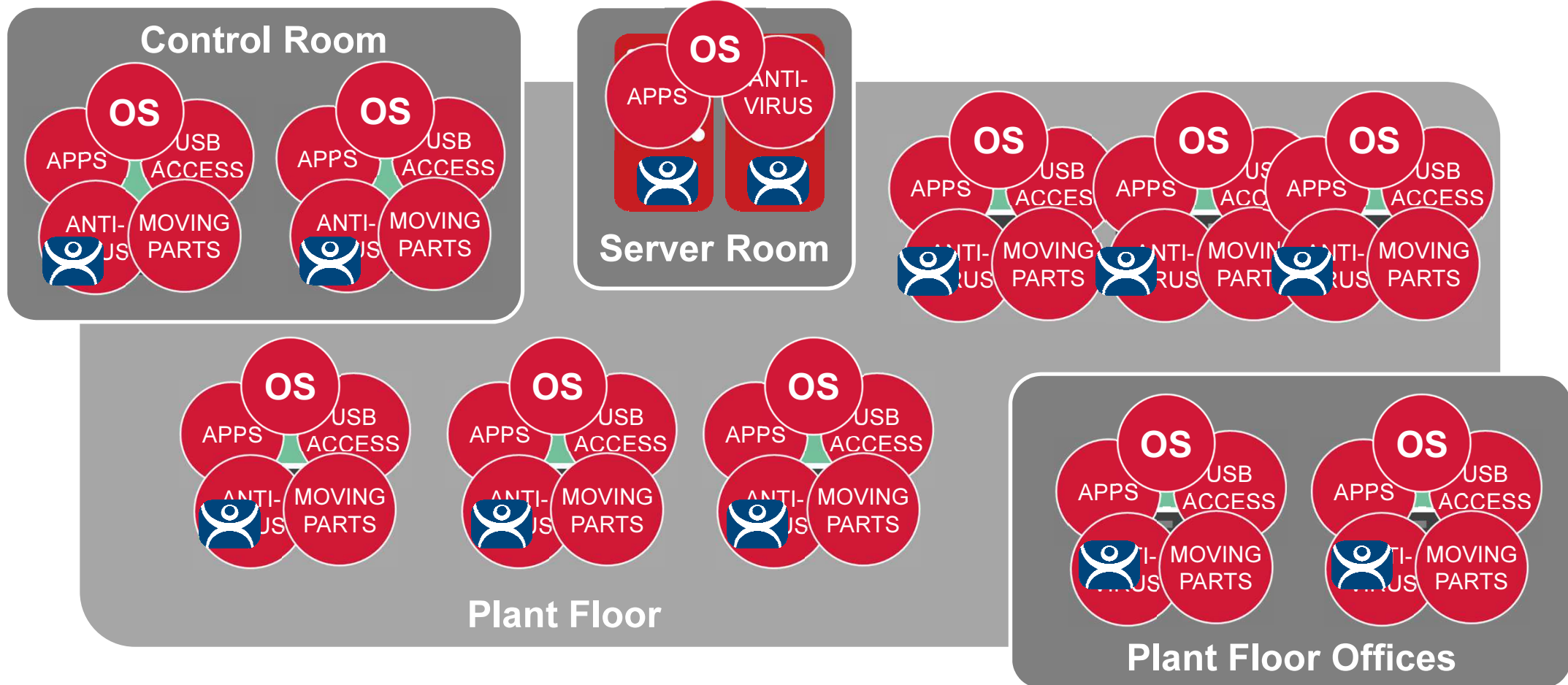
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ThinManager Solution

Replace PCs with Thin Clients and Manage Centrally

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Thin Client is Powered On

ThinManager terminal is powered on



ThinManager Firmware is Delivered

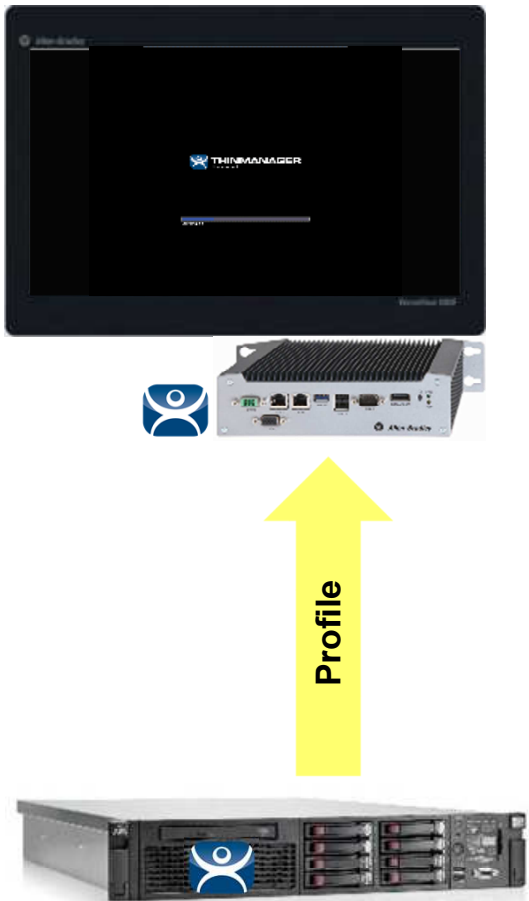
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ThinManager firmware is delivered to terminal

- The ThinManager firmware is delivered by the ThinServer service
- The firmware is the ThinManager OS
- It is delivered to a thin client right at boot time

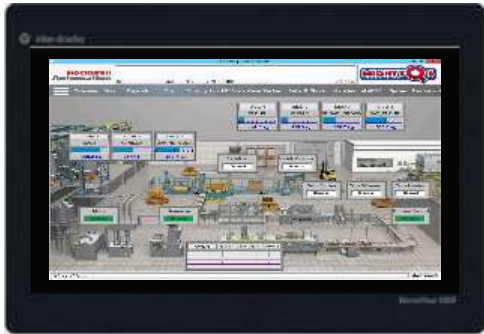
Terminal Profile is Delivered



ThinManager Terminal Profile delivered

- The Terminal Profile is also delivered by the ThinServer service
- The Terminal Profile defines the terminal content to deliver
- It also defines how to display or visualize the content
- Modules for touchscreens, badge readers, etc. can also be added to the terminal profile

Terminal Profile Content Delivered



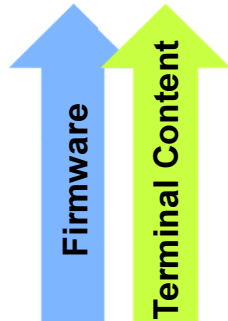
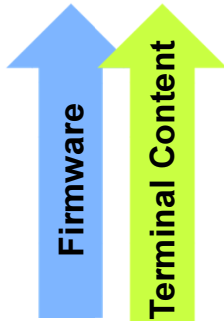
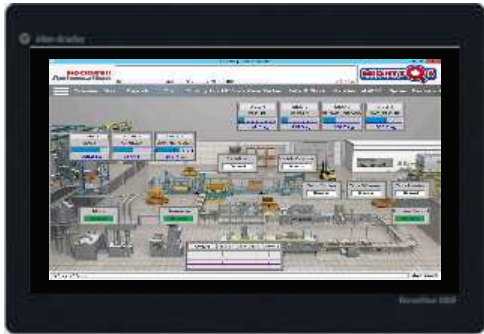
Terminal Content



Content assigned to Terminal Profile delivered

- ThinManager can deliver content in 3 different ways:
 1. Assign content to the terminal
 2. Assign content to a user or user role
 3. Assign content to a location (Relevance)

Failover and Redundancy



Failover

- Defined as multiple sources for your content
- For example: multiple Remote Desktop Servers

Redundancy

- Defined as multiple installs of ThinManager
- ThinManager installs automatically synchronized

MultiSession and Tiling



Terminal Content

Terminal Content



MultiSession and Tiling

- Delivering more than one content type to a terminal
- Example:
 - 2 FactoryTalk® View SE client instance
 - 1 FactoryTalk® View ME instance
 - 1 PanelView™ Plus Terminal Shadow

MultiMonitor

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MultiMonitor

- Up to 5 monitors can be connected to a single terminal
 1. Left monitor:
 - 2 FactoryTalk View SE client instances
 - 1 FactoryTalk View ME instance
 - 1 PanelView Plus shadow
 2. Right monitor
 - 1 FactoryTalk VantagePoint instance
 - 1 IP Camera

Virtual Screening

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Terminal Content

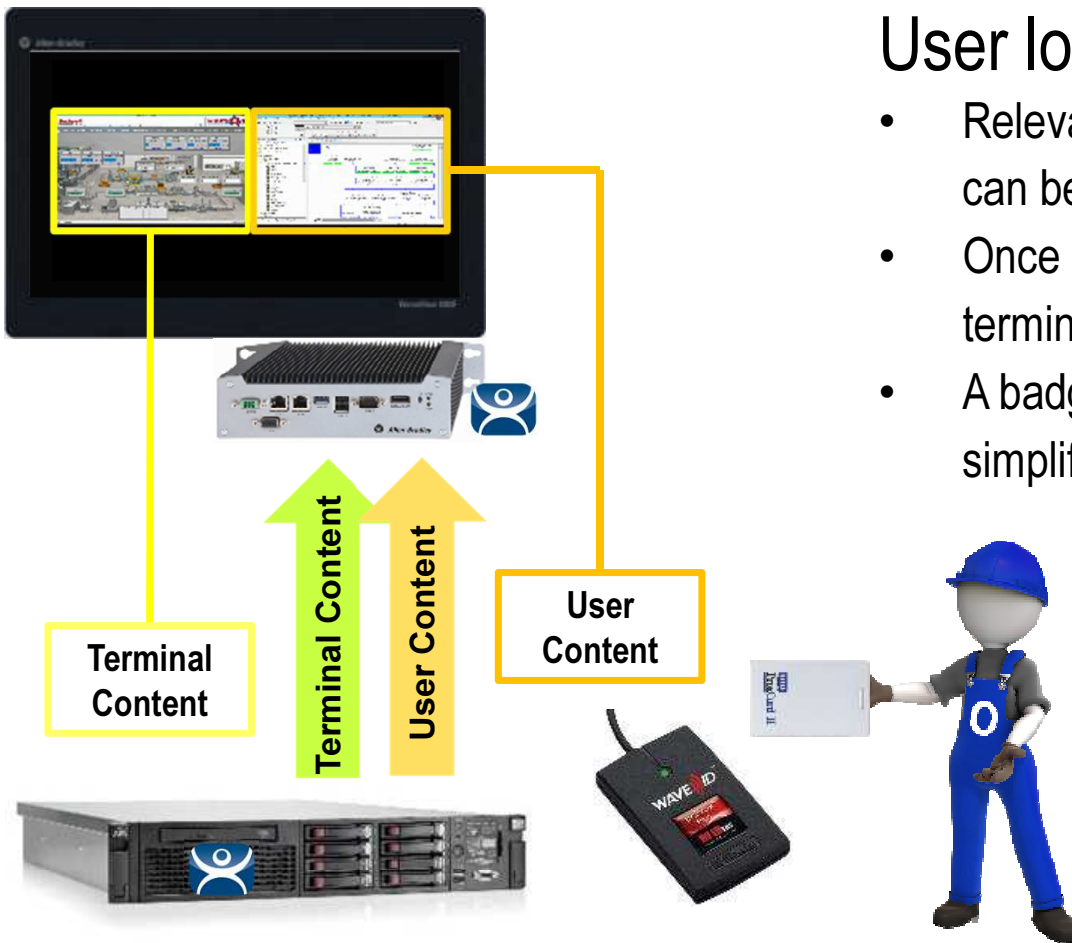
Terminal Content



Virtual Screening

- Evolution of MultiMonitor
- Similar to tiling, but layout is configurable
- Each Virtual Screen behaves like a physical display
- Tiling is supported within each virtual screen
- Can configure virtual screen swapping and full screen
- Content overlays fully supported

User Based Content Delivery

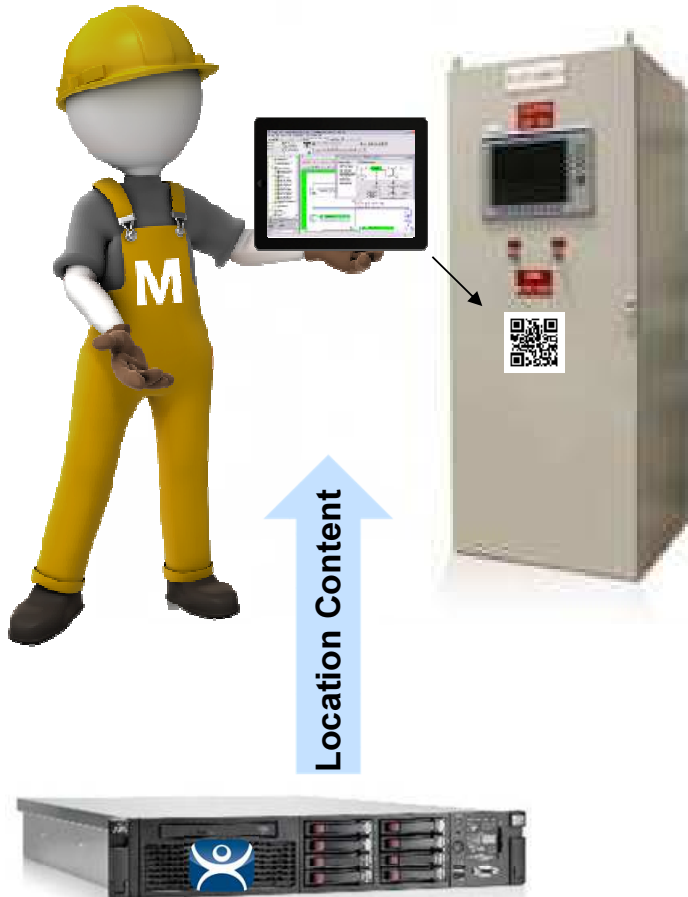


User logs in using Relevance User services

- Relevance User credentials can reside within ThinManager or can be linked to an Active Directory account
- Once authenticated, additional content can be delivered to the terminal based on the user or the user's role
- A badge or fingerprint can be associated with the user to simplify the login process

Location Based Mobility

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Relevance

- Mobile Devices are managed exactly the same way as thin clients in ThinManager.
- Each Location can be assigned content as well as a Location Resolver.
 - QR Codes
 - Bluetooth Beacons
 - WiFi Access Points
 - GPS
- Location content can be geo-fenced to physically limit where the content can be accessed.
- Example: QR Code on PLC panel is scanned by mobile device and an instance of Studio 5000 Logix Designer® is delivered to the tablet with the correct ACD file automatically opened.

VersaView[®] 5200 Box Thin Clients

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- Intel Atom Bay Trail single core (E3815), 2GB RAM
- -20°C – 60°C operating environment
- 24V DC power
- Global Certifications (cULus, CE, RCM, KC, EAC)
- Multiple mounting methods
- Dual HD external display support (DisplayPort & VGA) , dual 1Gbit/s Ethernet ports
- Rockwell Automation[®] ThinManager Ready



VersaView 5200 Panel Thin Clients

- Intel Atom Bay Trail single core (E3815), 1GB RAM
- Single external display support (DisplayPort), dual 1Gbit/s Ethernet ports
- Edge-to-edge all-glass widescreen multi-touch PCAP display
- 12.1in: 1280x800, 15.6in & 18.5in: 1366x768, 21.5in: 1920x1080 Full HD
- 0°C – 50°C operating environment
- IP65/NEMA 4 when installed in a panel or enclosure
- 24V DC power
- Global Certifications (cULus, CE, RCM, KC, EAC)
- Rockwell Automation ThinManager Ready
- Target AFC is July 2017



Sample Architectures

Small (Less Than 10 Terminals)



HMI Server

- FactoryTalk View SE Distributed
- RSLinx Enterprise
- FactoryTalk Alarms & Events
- FactoryTalk Network Directory
- FactoryTalk Activation Server



Remote Desktop Server

- Remote Desktop Services
- ThinManager
- FactoryTalk View SE Client
- FactoryTalk View Studio
- Studio 5000 Logix Designer

Medium* (Less Than 20 Terminals)



Domain Controller



FactoryTalk Directory Server

- FactoryTalk Network Directory
- FactoryTalk Activation Server



2 Redundant HMI/Data Servers

- FactoryTalk View SE Distributed
- RSLinx Enterprise
- FactoryTalk Alarms & Events



2 Remote Desktop Servers

- Remote Desktop Services
- ThinManager
- FactoryTalk View SE Client
- FactoryTalk View Studio
- Studio 5000 Logix Designer

Large* (Less Than 50 Terminals)



2 Domain Controllers



FactoryTalk Directory Server

- FactoryTalk Network Directory
- FactoryTalk Activation Server



6 Redundant HMI/Data Servers

- FactoryTalk View SE Distributed
- RSLinx Enterprise
- FactoryTalk Alarms & Events



3 Remote Desktop Servers

- Remote Desktop Services
- ThinManager
- FactoryTalk View SE Client
- FactoryTalk View Studio
- Studio 5000 Logix Designer

Benefits of the ThinManager Platform

- **Total Cost of Ownership. ThinManager...**
 - **Increases productivity** (centrally manage content, users and devices with a simple easy-to-use interface)
 - **Improves visualization** (customize multiple monitors and virtual screens)
 - **Increases security** (no locally stored data, content delivered based on role and/or location)
 - **Provides location-based mobility** (exclusive mobile security)
 - Decreases maintenance costs and downtime

PRODUCTIVITY



VISUALIZATION



SECURITY



MOBILITY



Managed Thin Client Benefits

- **Lower total cost of ownership than PCs over the lifetime of the system:**
 - Less likely to fail because they don't have hard drives or fans
 - Easier to replace when they do fail, significantly reducing downtime
 - Smaller and require less power to operate and cool
 - Fewer client operating systems to manage
- **More secure:**
 - No local storage – nothing is stored on device
 - Can eliminate the Windows Desktop
 - USB ports are disabled by default for everything except keyboards/mice

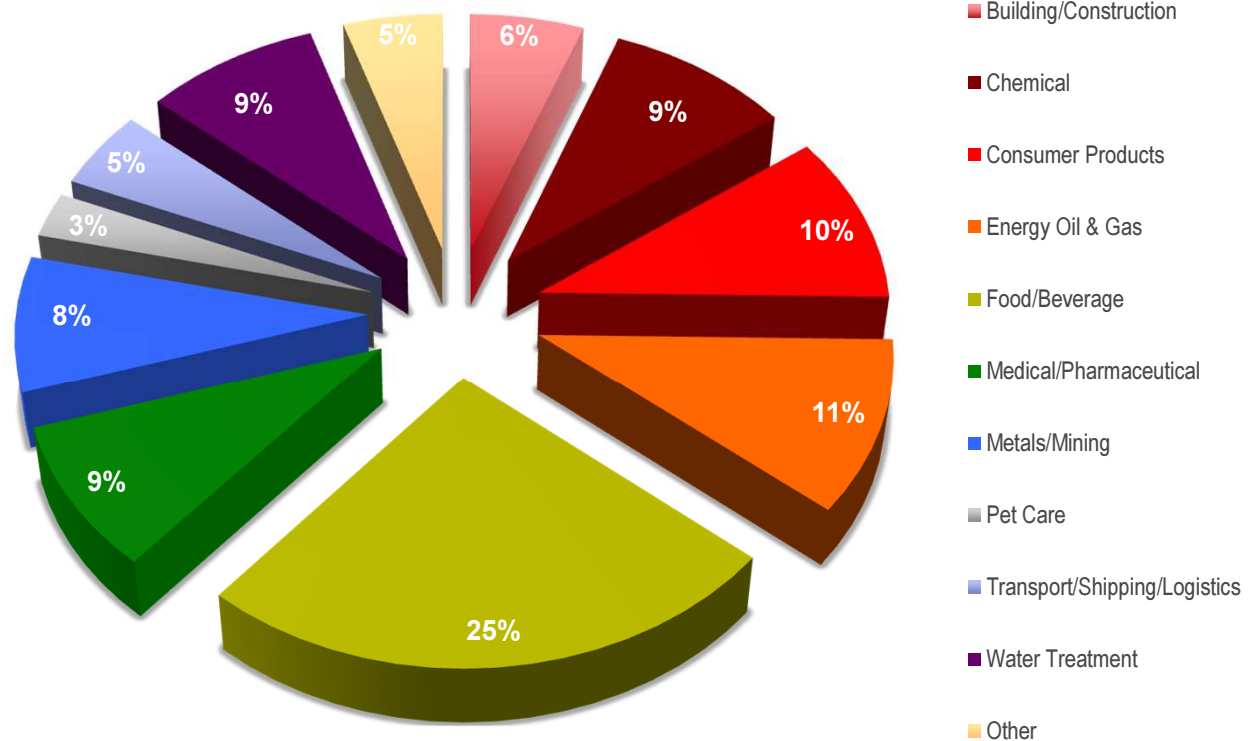


Positioning

- **ThinManager is purpose-built.** It is a content and device management solution designed **specifically for manufacturing environments**
- **ThinManager is an OT-centric solution**
 - Reliance on IT is reduced allowing the critical plant floor content to be owned and managed by Engineering and Maintenance.
- **ThinManager is simple to deploy and manage**
- ThinManager is the only end to end solution that manages everything from the server side down to the client itself
- ThinManager's flexible content management, delivery and visualization options are unique to the product

Industry Positioning

- The ThinManager platform is applicable across a broad spectrum of process and discrete industries, as the deployment chart depicts.
- The value proposition applies equally across the broad expanse of this space with over 60,000 seats sold at over 3,000 locations worldwide.



How is it Licensed?

CLIENT CONNECTIONS Sold in Packs of 5, 10 or 25.



**ThinManager Also Offers Redundant Licensing
Options to Ensure High Availability.**

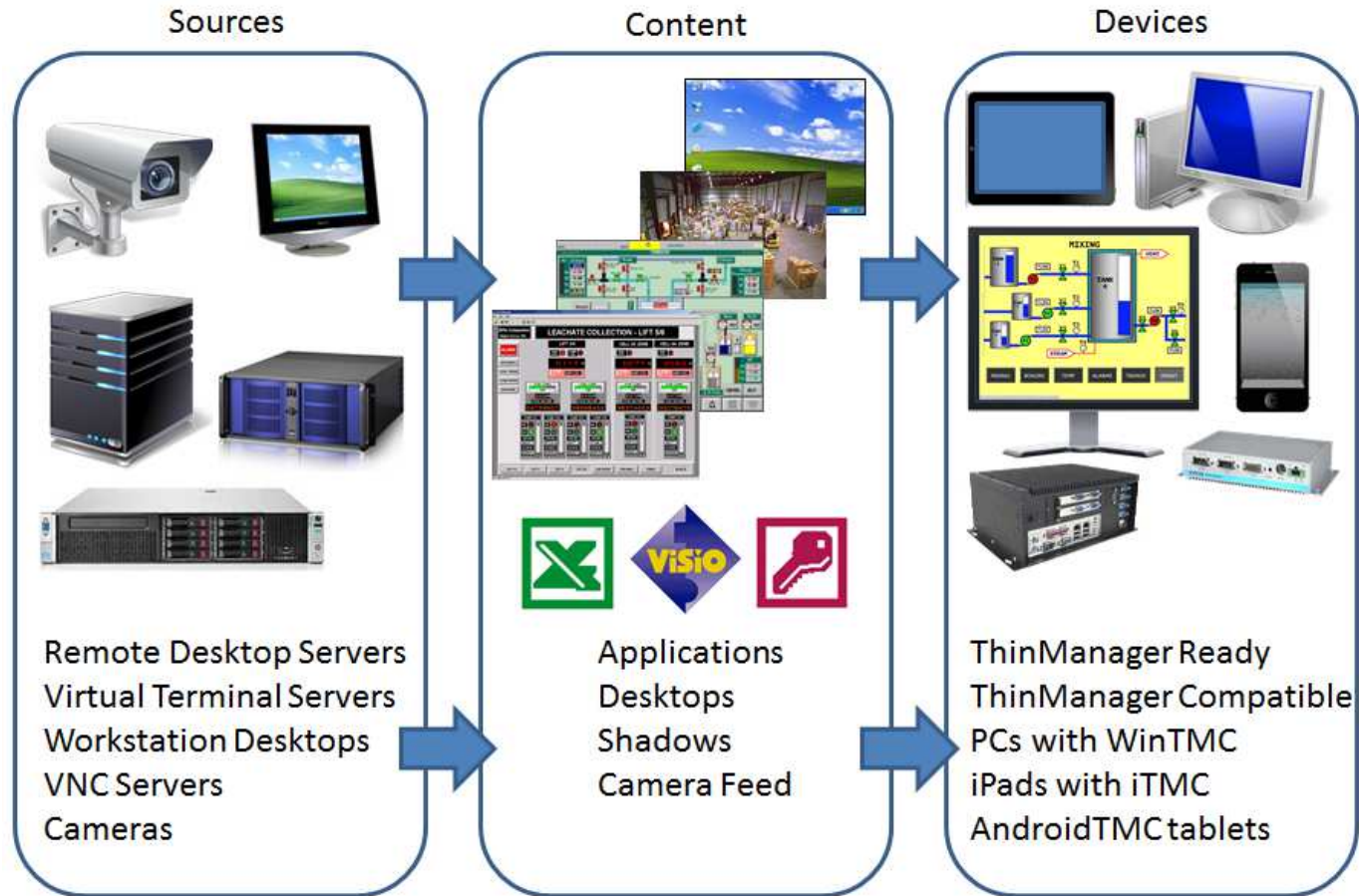
ENTERPRISE SERVER Sold by ThinServer installs. Client Connections are Unlimited.



Other Licensing Considerations

- Remote Desktop Client Access Licenses (RDSCALs)
 - There are 2 types available:
 1. Per User – each unique user session requires an RDSCAL
 2. Per Device – each device receiving a session requires an RDSCAL
 - Per Device is generally more suitable for ThinManager deployments
- FactoryTalk Licensing
 - Currently, every Remote Desktop Server session delivering a FactoryTalk client application requires a separate FactoryTalk client license

ThinManager Content Delivery



Why ThinManager?

- OT-Centric Solution Designed for the Plant Floor
- Zero Client -> No OS -> Easier to Manage
- Automatic Terminal Server Failover
- Industrial Thin Clients & Broad Touchscreen Support
- Redundant Networking Options at Zero Client
- Full Control of the Physical Thin Client
- Simple Thin Client Shadowing
- Terminal to Terminal Shadowing
- Deliver Multiple Sessions to Thin Client
- Deliver Sessions Based on User Role
- IP/USB Camera Integration
- Extensibility with ActiveX Control
- Relevance = Location Based Mobility

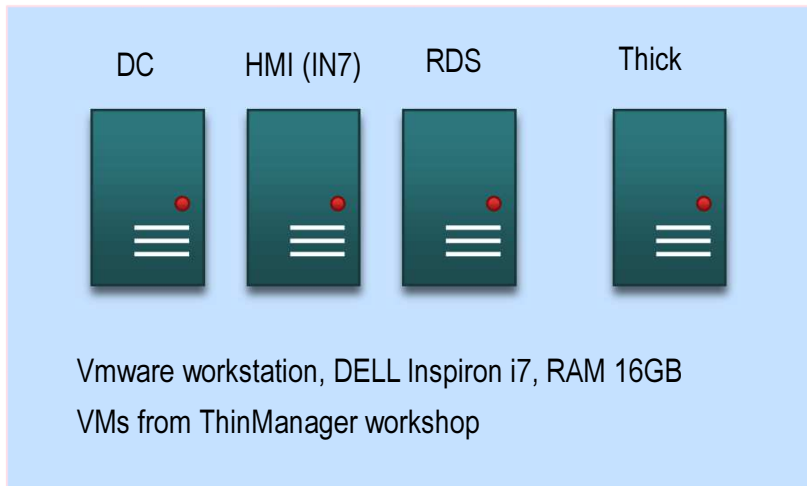
Configuration Wizards

Easily select the functionality you need without any coding.

Quick Replacement

Most ThinManager thin clients can be replaced by anyone in under 2 minutes without any loss of data!

Demo Architecture



Network Adapter – Bridged to physical port
IP range 10.10.10.x

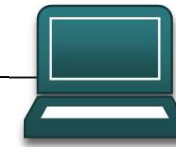
PVP7
As VNC
server



Wifi Router
IP range 10.10.10.x
DHCP 10.10.10.100-110



ThinClient
PXE, old notebook



ThinClient - spare
PXE, old notebook



ThinClient
VersaView 5200



ThinClient - spare
PXE, old notebook



Components of TM...

ThinManager is primarily composed of 2 components – the ThinServer service and the ThinManager user interface.

The ThinServer service is a Windows based service that is the engine of ThinManager. It delivers the terminal's firmware and configuration, and therefore is essential in order for a terminal to boot. The ThinServer is also the licensed component of ThinManager.

The ThinManager user interface, on the other hand, is not licensed, and is the interface from which you manage the entire ThinManager environment. It can be installed and run as many times as needed.

While these 2 components do not have to be co-located or installed on a Remote Desktop Server, they often are due to the benefits of the Remote Desktop Services architecture.

Configure PXE Server

ThinManager supports 2 types of thin or zero clients:

1. ThinManager Ready
2. ThinManager Compatible

ThinManager Ready terminals have ACP's BIOS extension image embedded in them by the manufacturer. When these terminals are powered on, they know how to find a ThinManager Server right out of the box. Once found, the ThinServer service delivers the terminal's firmware and configuration.

ThinManager Compatible terminals do not have ACP's BIOS extension image. However, the ThinManager firmware is hardware compatible with the majority of thin clients on the market. This is because the ThinManager firmware is compiled for the x86 platform, and the majority of thin clients are x86-based. In order to deliver the ThinManager firmware to these devices, PXE is utilized. Preboot eXecution Environment (PXE) is an Intel standard whereby an operating system can be delivered over the network.

Functionally, there is no difference between a ThinManager Ready terminal and a ThinManager compatible terminal.

Redundancy...

Redundancy



Full Redundancy uses a redundant pair of ThinManager Servers. ThinManager licenses and configurations are stored on both servers with a fully accessible ThinManager GUI. If terminals can't find the primary ThinManager Server they will boot from the redundant ThinManager Server and receive the same configurations and instructions as well as full access to the ThinManager application with the administrator console.



Mirrored Redundancy

allows a synchronized pair of ThinManager servers. The primary server contains a fully functional version of ThinManager with the administrator console and allows monitoring and configuration of terminals. The secondary "mirrored" ThinManager server holds an exact copy of the licenses and configurations from the primary server. ThinManager on the mirrored server is a "view-only" interface that cannot be edited. Terminals can boot from either server and receive the same configuration. Mirrored redundancy costs 50% less than full redundancy.

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Questions

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