AI-02037 IT Infrastructure Strategic and Execution Plan

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Tags	Project
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I need help in designing an IT infrastructure for a small PCP clinic in Florida with following items in mind:

1. **OpenEMR in Ubuntu Server on Hyper-V**
2. **Wordpress application**
3. **Windows Dell Enterprise Notebook**
4. **24u Server racks with PDU, Cisco Poe switches and routers**
5. **Dell Poweredge R630 servers with robust disaster recovery options**
6. **Sysadmin able to login and work on and off premise.**

Request:

1. **Create an IT Infrastructure strategy**
2. **Create a high macro level IT infrastructure development and deployment and operational plan**
3. **Create a bill of materials and cost**
4. **Create a micro-level IT infrastructure execution task list**

An IT infrastructure for a small PCP clinic needs to be reliable, secure, and compliant with healthcare regulations like HIPAA. This plan leverages on-premise hardware for performance and data control, with a focus on remote management and robust data protection.

IT Infrastructure Strategy

The core strategy is to build a hybrid IT infrastructure that combines the control

and performance of on-premise hardware with the flexibility of cloud-based services for specific applications and disaster recovery. This approach ensures data security and low-latency access for clinical staff while providing the necessary resilience against outages.

1. Server Virtualization: By using Hyper-V on a powerful Dell PowerEdge R630 server, you can run multiple virtual machines (VMs) on a single physical server. This is cost-effective, simplifies management, and provides a clear path for scaling. OpenEMR will run on an Ubuntu Server VM for security and stability, while a separate VM can be used for other applications or testing.
2. Networking and Security: The network will be built on Cisco PoE switches and routers to provide reliable, high-speed connectivity and power to devices like VoIP phones and wireless access points. A robust firewall and network segmentation will protect patient data.
3. Disaster Recovery (DR): A multi-layered DR plan is crucial. This includes local backups of the OpenEMR VM, a secondary Dell PowerEdge R630 server for failover, and a cloud-based backup solution for off-site data replication. This ensures business continuity in case of hardware failure or a natural disaster.
4. Remote Management: The sysadmin will use a Virtual Private Network (VPN) for secure on-and-off premise access to the network and servers. The Dell PowerEdge iDRAC (Integrated Dell Remote Access Controller) will be used for out-of-band management of the server, allowing the sysadmin to perform maintenance even if the operating system is down.
5. Endpoint Hardware: Dell Enterprise Notebooks will be the standard for all clinical staff, chosen for their reliability, security features, and serviceability.

High Macro-Level IT Infrastructure Plan

This plan outlines the key phases from development to ongoing operations.

1. **Phase 1: Design & Procurement (Weeks 1-4):**
    - Finalize network topology, server specifications, and security policies.
    - Procure all hardware (servers, notebooks, racks, switches, etc.) and software licenses.
    - Begin setting up the 24U server rack, including power distribution units (PDUs).

2. **Phase 2: Development & Deployment (Weeks 5-8):**
    - Install the Dell PowerEdge R630 servers and configure the Hyper-V environment.
    - Deploy the Ubuntu Server VM and install OpenEMR.
    - Deploy a separate VM for the Wordpress application or consider a managed hosting solution for simplicity and security.
    - Configure the Cisco network switches and routers, including VLANs for network segmentation.
    - Install and configure security measures, including the firewall and VPN.
    - Set up local backup procedures and the off-site cloud-based backup.
3. **Phase 3: Operational & Maintenance (Ongoing):**
    - Conduct regular security audits and vulnerability scans.
    - Monitor system performance and network traffic.
    - Implement a regular patching and update schedule for all servers and endpoints.
    - Conduct periodic disaster recovery tests to ensure data can be restored quickly.
    - Provide ongoing user support and training for the clinical staff.
4. **Bill of Materials and Cost**

Costs are approximate and can vary based on vendors and specific models.

Item	Description	Quantity	Approximate Cost (USD)
Servers	Dell PowerEdge R630 with dual CPUs, 64GB RAM, and 2× 1TB SSD in RAID 1 (for OS) and 4× 4TB HDD in RAID 10 (for data).	2	$3,000 - $6,000 each
Server Rack	24U Server Rack with integrated PDU	1	$500 - $1,500

Network Gear	Cisco Catalyst 2960-X 24-Port PoE+ Switch	1	$1,000 - $2,000
	Cisco RV340 Router/Firewall	1	$300 - $500
Endpoint Hardware	Dell Latitude 5000 Series Notebook	5	$1,000 - $1,500 each
Software	Microsoft Windows Server 2022 license (for Hyper-V)	1	$500 - $1,000
	Ubuntu Server (Free)	N/A	$0
	OpenEMR (Free/Open Source)	N/A	$0
	Wordpress (Self-hosted)	N/A	$0
Other	Cabling, power cords, rack accessories, labels.	1 set	$200 - $400
Cloud Services	Off-site backup service (e.g., Veeam, Acronis)	N/A	$50 - $200 per month
TOTAL ESTIMATED COST (INITIAL CAPITAL EXPENDITURE)			**$10,000 - $20,000**

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Micro-Level IT Infrastructure Execution Task List
This is a detailed, step-by-step checklist for the sysadmin.

1. **Server and Virtualization Setup:**
    a. Install Dell PowerEdge R630 servers in the rack and connect to PDUs.
    b. Configure RAID on both servers.
    c. Install Windows Server 2022 on the first R630.
    d. Enable and configure the Hyper-V role.
    e. Create a new VM for the Ubuntu Server and assign resources (CPU, RAM, storage).
    f. Install Ubuntu Server on the new VM.
    g. Install and configure OpenEMR and its prerequisites (Apache, MySQL, PHP) on the Ubuntu VM.

h. Configure a separate VM for the Wordpress installation.

2. **Network Configuration:**
    a. Connect the Cisco router to the clinic's internet service provider (ISP).
    b. Connect the Cisco PoE switch to the router.
    c. Configure the router's firewall rules and set up the VPN for remote access.
    d. Create VLANs for the clinical network, guest Wi-Fi, and VoIP phones on the switch.
    e. Run and terminate network cables to all offices and examination rooms.
3. **Security and Data Protection:**
    a. Configure user roles and permissions in OpenEMR and on the network to enforce the principle of least privilege.
    b. Implement Multi-Factor Authentication (MFA) for all sensitive logins.
    c. Set up local backups for the OpenEMR VM and other critical data.
    d. Configure the cloud-based backup solution to replicate critical data off-site daily.
    e. Enable Dell iDRAC on both servers and configure remote access for the sysadmin.
4. **Endpoint Deployment:**
    a. Image the Dell Enterprise Notebooks with a standard operating system and software.
    b. Join the notebooks to the clinic's domain/workgroup.
    c. Install necessary applications, including a secure browser for OpenEMR access.
    d. Configure user profiles and connect each notebook to the network.
5. **Operational Checks:**
    a. Test all hardware and software for proper functionality.
    b. Perform a full test of the disaster recovery plan by simulating a server failure.

c. Train clinical staff on how to use the new systems and report issues.