Blue Ridge Community College District

By: Danielle Santamaria, Liliana Sifuentes, Berenice Fuentes, Samuel Avila, and Carlos Morota

Introduction Overview

Bluebridge Community College District is composed of 3 community colleges.

Plan: Design for an energy - efficient network infrastructure for the college campuses. Our main focus is selecting energy efficient servers and creating a flexible, sustainable network that minimizes operational costs while providing the necessary services for the college campuses. Following through we will explore our approach to designing the structure that meets the technical needs of the schools at the same time incorporates green IT practices.

Project Charter

BlueRidge Community College District

PROJECT CHARTER

1. General Project Information	
Project Name:	Green IT Labs Initiative
Executive Sponsors:	BlueRidge Community College District Board
Department Sponsor:	IT Department and Sustainability Office
Impact of project:	Reduces the district's carbon footprint by adopting energy-efficient computing practices. Provides students hands-on experience with green technology. Decreases energy costs and promotes sustainability across all three campuses.
Budget:	Estimated at $500,000-$1.5M for hardware, software, and implementation costs. Savings $300,000 annually.

2. Project Team

		Name	Department	Telephone	E-mail
Project Manager:		Samuel Avila	IT Department	(323) 555-9870	sam1a@calstatela.edu
Team Members:		Berenice Fuentes	Facilities Management	(310) 212-2345	berfuentes2@calstatela.edu
		Carlos Morota	Sustainability Office	(213) 345-9701	car7mo@calstatela.edu
		Liliana Sifuentes	Student Services	(323) 211-0975	lilisin90@calstatela.edu
		Danielle Santamaria	Faculty Representative	(213) 332-9098	dans7@calstatela.edu

3. Stakeholders ***(e.g., those with a significant interest in or who will be significantly affected by this project)***

Executive sponsors and campus administrators.

IT staff responsible for setup and maintenance.

Faculty and students who will use the labs.

Community partners and green technology vendors.

4. Project Scope Statement

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Project Purpose / Business Justification *Describe the business need this project addresses*

The Green IT Labs Initiative addresses the need for sustainable computing practices across the district. This project reduces operational costs, and aligns with districts environmental goals.

Objectives (in business terms) *Describe the measurable outcomes of the project, e.g., reduce cost by xxxx or increase quality to yyyy*

Reduce energy consumption in computer labs by 30%. Provide hands-on training for students on green computing technologies. Improve the environmental impact of the district's IT infrastructure.

Deliverables *List the high-level "products" to be created (e.g., improved xxxx process, employee manual on yyyy)*

Energy-efficient hardware in labs (e.g., thin clients, LED monitors).
Cloud-based virtual desktop systems.
IoT-enabled energy management dashboards.
Training materials for staff and students on green IT practices.

Scope *List what the project will and will not address (e.g., this project addresses units that report into the Office of Executive Vice President. Units that report into the Provosts Office are not included)*

This project will address the modernization of computer labs across all three campuses. It includes integrating new energy-efficient hardware and cloud-based systems into existing IT infrastructure, as well as providing comprehensive training for staff and students on utilizing and maintaining the new systems. The project will not only include upgrades or changes to administrative offices or facilities that are not directly related to IT operations, such as non-computing academic spaces or non-IT departments.

Project Milestones *Propose start and end dates for Project Phases (e.g., Inception, Planning, Construction, Delivery) and other major milestones*

Phase 1: Planning and design (Start: 11/4/2024, End: 6/3/2025)
Phase 2: Pilot implementation on one campus (Start: 6/3/2025, End:9/3/2025)
Phase 3: District-wide rollout (Start: 9/27/2025, End: 10/27/2025)
Phase 4: Monitoring and evaluation (Start: 10/30/2025, End: 12/20/2025)

Major Known Risks (including significant) *Identify obstacles that may cause the project to fail.*

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Risk	Risk Rating (Hi, Med, Lo)
High initial setup cost	Medium
Staff adaptation to new systems	Medium
Technical integration issues	Low

Constraints *List any conditions that may limit the project team's options with respect to resources, personnel, or schedule (e.g., predetermined budget or project end date, limit on number of staff that may be assigned to the project).*

Limited budget allocated for green technology.
Availability of IT staff and faculty for training and setup.

External Dependencies *Will project success depend on coordination of efforts between the project team and one or more other individuals or groups? Has everyone involved agreed to this interaction?*

Vendor collaboration for hardware and cloud services.
Coordination with sustainability experts for training programs.

5. Communication Strategy *(specify how the project manager will communicate to the Executive Sponsor, Project Team members and Stakeholders, e.g., frequency of status reports, frequency of Project Team meetings, etc.*

Weekly project team meetings to track progress.
Bi-weekly status reports to executive sponsors.
Monthly updates to stakeholders and community partners.
Training workshops for faculty, staff, and students at key milestones.

6. Sign-off

	Name	Signature	Date (MM/DD/YYYY)
Executive Sponsor	Linda Carabello (President of Board)	Linda Carabello	12/2/2024
Department Sponsor	Gary Houston	Gary Houston	12/3/2024
Project Manager	Samuel Avila	Samuel Avila	12/3/2024

7. Notes

BlueRidge Community College District

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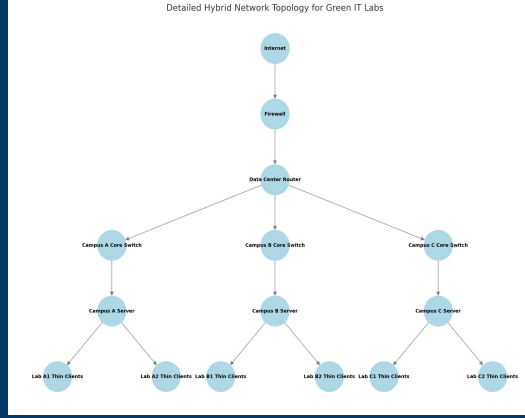
Department Sponsor:	IT Department and Sustainability Office

This project supports the district's commitment to sustainability and modernizing infrastructure in alignment with long-term strategic objectives.

Our Network Topology



Hybrid Topology

Why Hybrid Topology?

A **Hybrid Topology** combines elements of star, bus, and other topologies, making it highly flexible. This type of topology is ideal for the Green IT Labs project as it allows for efficient data transfer, reliability, and ease of expansion.

Key Features of the Hybrid Topology for the Green IT Labs

1. **Core Structure**:
   - A **star topology** is used at the campus level to connect key network components (e.g., servers, core switches, and routers) to ensure central control and easy troubleshooting.
2. **Lab-Level Network**:
   - **Bus topology** or **ring topology** within each lab ensures minimal cabling and cost efficiency, while also supporting the centralized computing model (e.g., thin clients accessing cloud-based systems).
3. **Inter-Campus Connectivity**:
   - Fiber-optic connections link the three campuses, forming a reliable backbone to ensure high-speed communication and centralized cloud access. **Scalability**:Easily accommodates new devices or labs as the district expands its IT infrastructure.

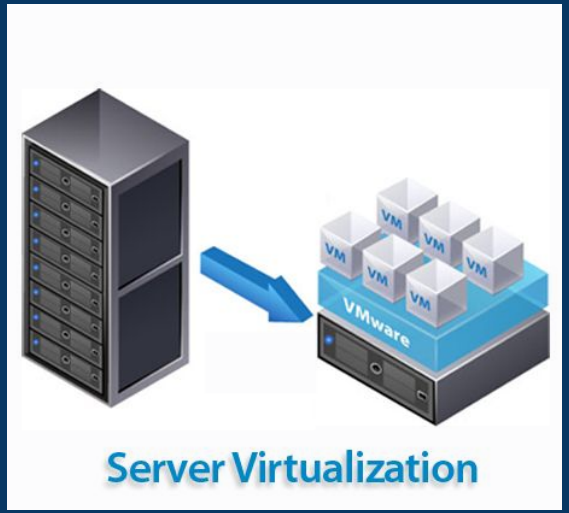
- **Internet**: Connection to the external network.
- **Firewall**: Security layer for protecting the network.
- **Data Center Router**: Central hub connecting all campuses.
- **Core Switches**: One for each campus to manage local traffic.
- **Campus Servers**: Supporting lab operations and data processing.
- **Lab Thin Clients**: Energy-efficient end-user devices connected to the campus servers.

Server & Rack Setup

Reduced Physical Hardware: Virtual servers consolidate multiple workloads onto fewer physical machines, decreasing the total number of servers needed, which directly reduces energy consumption and cooling requirements.

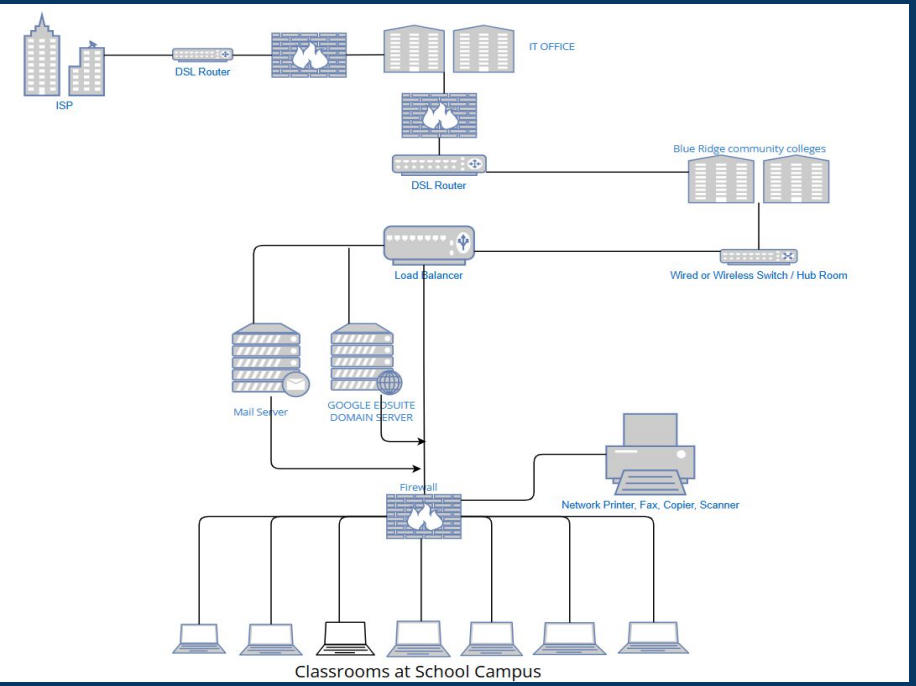
Optimized Resource Allocation: Virtualization allows for dynamic scaling of resources, ensuring that energy is only used when necessary, preventing over-provisioning and minimizing waste.

Extended Hardware Life: By maximizing hardware utilization and reducing the need for frequent hardware replacements, virtual servers help extend the life of IT equipment, decreasing e-waste and contributing to overall sustainability.

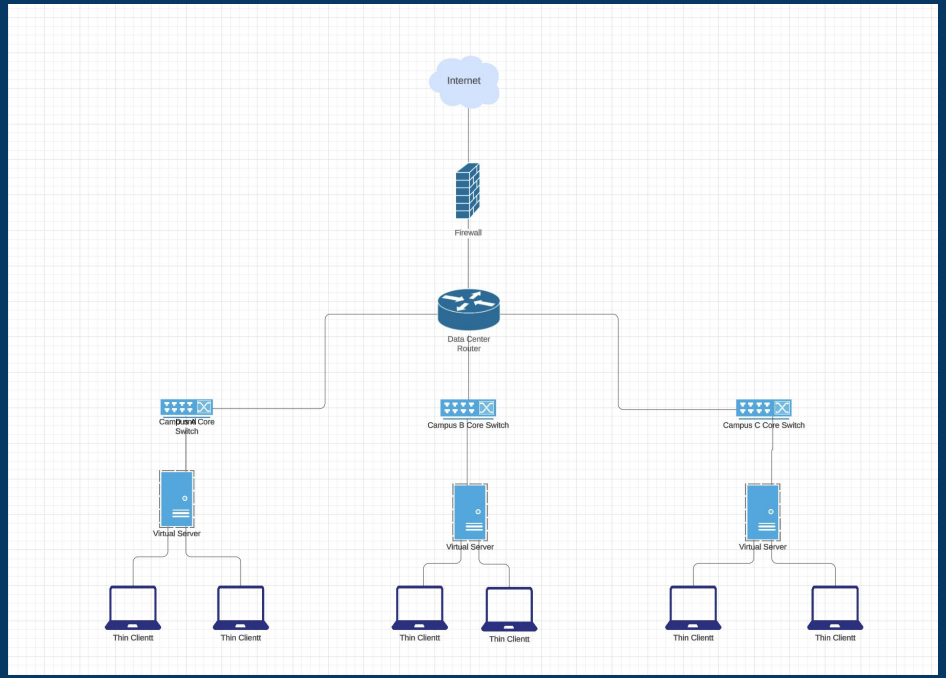


Network Diagram

District Network Diagram



Each Campus Network Diagram



Switches

Data Center Core Switch: Cisco Catalyst 9200 Series
Campus Core Switches: HPE Aruba 2930M for inter-campus routing.
Lab Access Switches: Ubiquiti UniFi Switch 48 for PoE and edge connectivity.

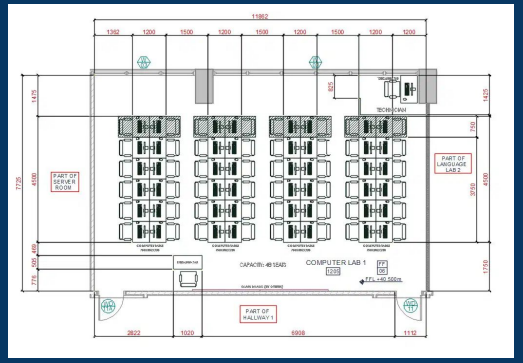
Cisco Catalyst 9200 Series Switches

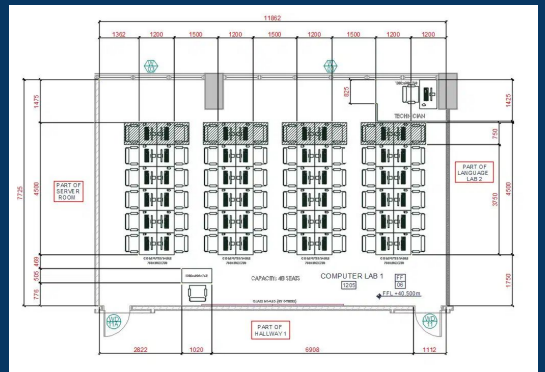
HPE Aruba 2930M

Ubiquiti UniFi Switch 48

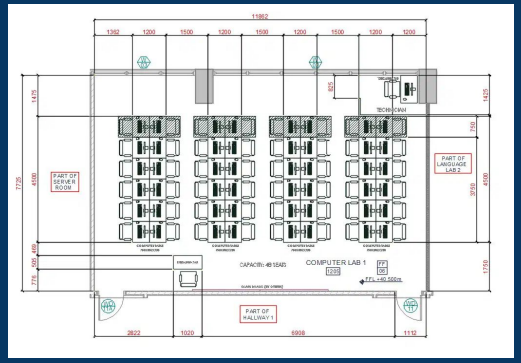
Floor Plans for Computer Labs

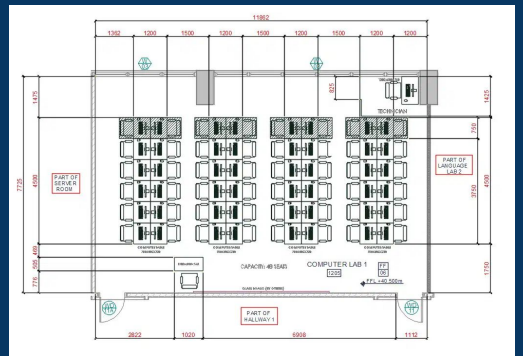
Greenwood Community College



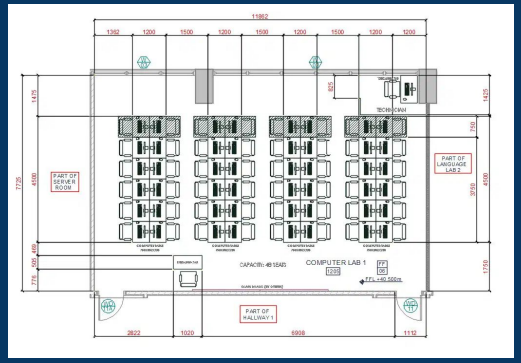


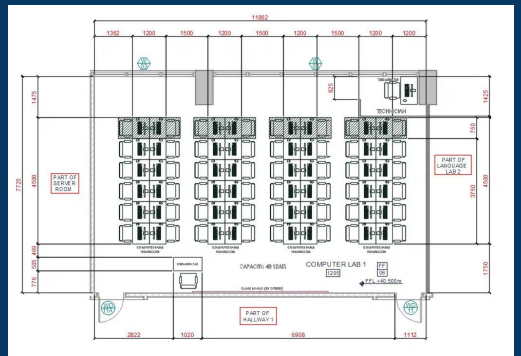
Sun City College





Calabrian Trade College





Budget Overview

Category	Description	Estimated Cost	Actual Cost	Variance
Hardware Costs	Servers, PCs, Printers, Network Switches	150,000	250,000	-100,000
Software Costs	Operating system licenses, virtualization tools	80,000	150,000	-70,000
Infrastructure Setup	Newtworking cabling, installation	50,000	80,000	-30,000
Cloud Services and Virtualization	Cloud Storage, VDI, Backup Services	70,000	120,000	-50,000
Energy- Efficent Hardware	Low- power devices, energy- efficent monitors	60,000	100,000	-40,000
Training	Staff training	30,000	50,000	-20,000
Consultation & Vendor Fees	Network design consultant	50,000	80,000	-30,000
Operational & Maintence	Server Maintenance, power costs	30,000	70,000	-40,000
Contigency Fund	5% of total budget	30,000	50,000	-20,000
Total		600,000	1,000,000	-400,000

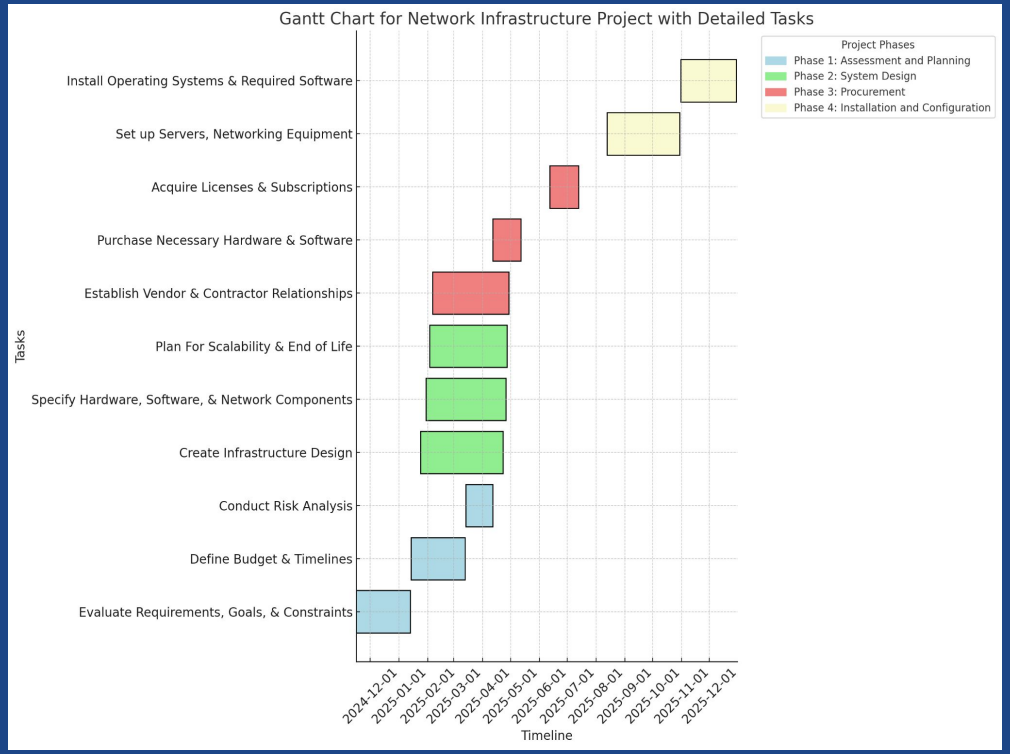
GANTT Chart

Project scheduled for a 2 year completion date

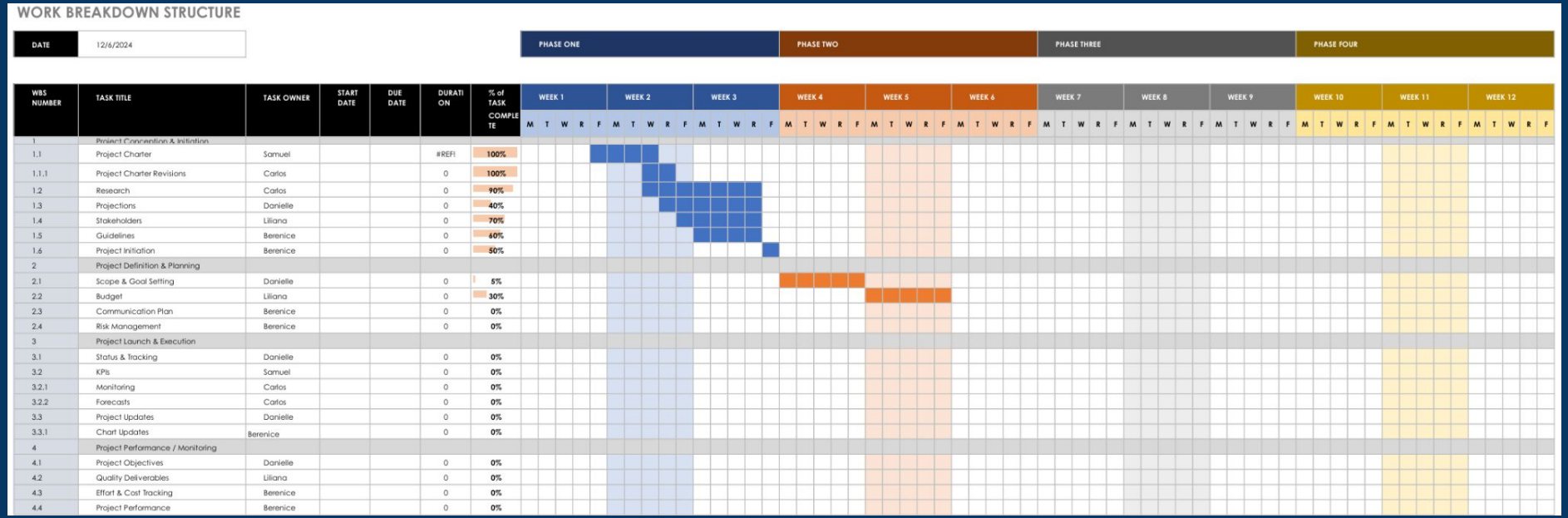
Workweek only. MON-Friday

Broken into 4 phases
Phases and tasks issues depending on each person's role.

ID	Task Mode	Duration	Task Name	Start	Finish
1		**91 days**	**Phase 1: Assesment and Planning**	**Wed 11/15/2024**	**Tue 2/15/2025**
2		45 days	Evaluate Requirements, Goals, & Constraints	**Wed** 11/16/2024	**Mon** 2/13/2025
3		24 days	Define Budget & Timelines	**Mon** 12/13/2024	**Thu** 3/13/2025
4		22 days	Conduct Risk Analysis	**Mon** 12/15/2025	**Mon** 4/12/2025
5		**135 days**	**Phase 2: System Design**	**Thu 1/13/2025**	**Fri 4/15/2025**
6		67 days	Create Infrastructure Design	**Tue** 1/24/2025	**Wed** 4/23/2025
7		44 days	Specify Hardware, Software, & Network Components	**Wed** 1/30/2025	**Mon** 4/26/2025
8		23 days	Plan For Scalability & End of Life	**Thu** 2/3/2025	**Thu** 4/27/2025
9		**89 days**	**Phase 3: Procurement**	**Mon 2/6/2025**	**Tue 4/28/2025**
10		23 days	Establish Vendor & Contractor Relationships	**Wed** 2/13/2025	**Fri** 4/29/2025
11		44 days	Purchase Necessary Hardware & Software	**Mon** 4/12/2025	**Mon** 5/12/2025
12		21 days	Acquire Liscenses & Subscriptions	**Mon** 6/12/2025	**Thu** 7/13/2025
13		**108 days**	**Phase 4: Installation and Configuration**	**Thu** 8/13/2025	**Fri** 12/30/2025
14		65 days	Set up servers, Networking Equipment, &	**Wed** 1/30/2026	**Mon** 2/30/2026
15		22 days	Install Operating Systems and Required Software	**Mon** 2/23/2026	**Mon** 3/30/2026
16		21 days	Configure Network & Security Settings	**Fri** 5/30/2026	**Mon** 6/30/2027



Work Breakdown Structure Timeline



WORK BREAKDOWN STRUCTURE

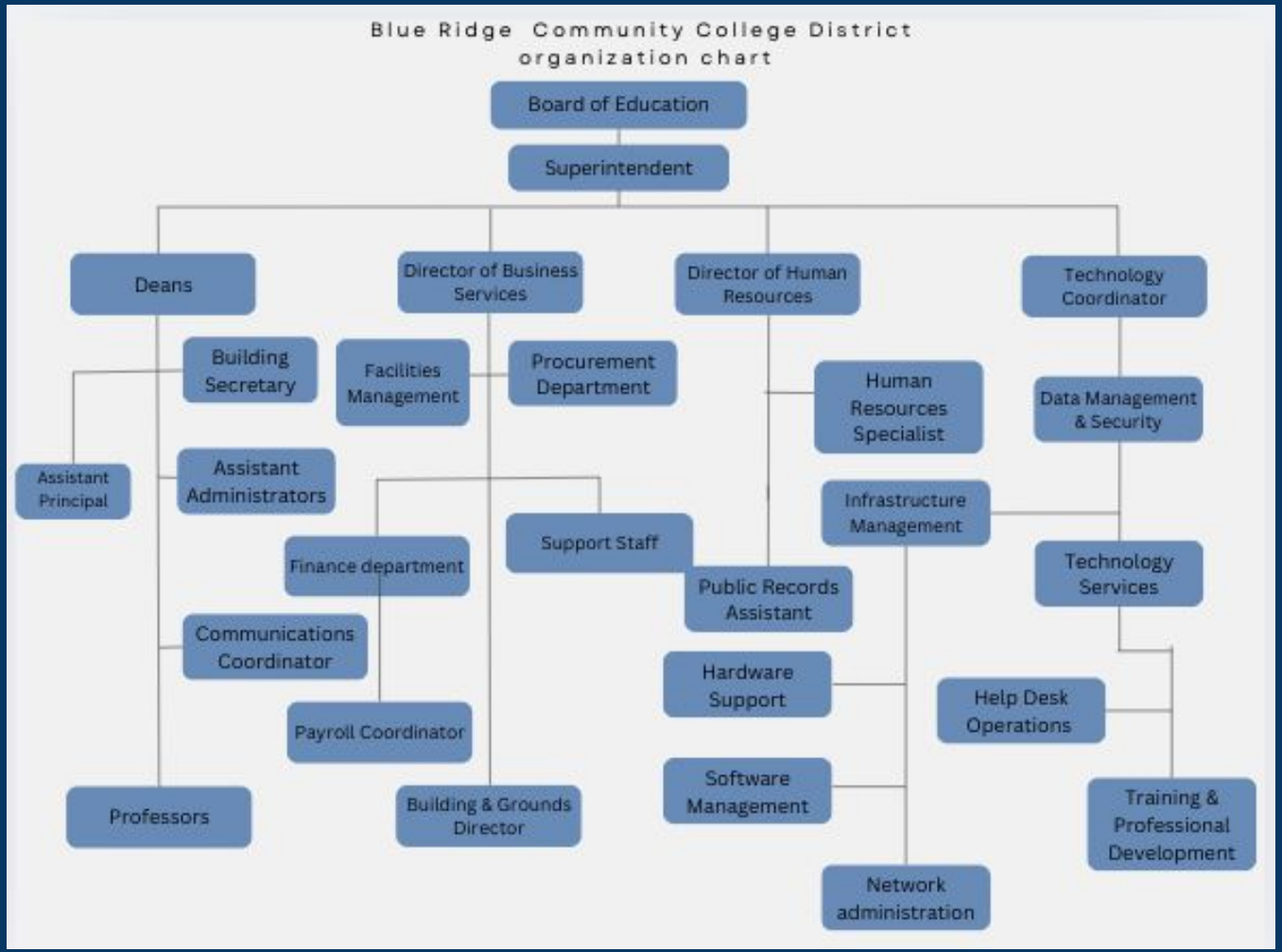
DATE 12/6/2024

PHASE ONE | PHASE TWO | PHASE THREE | PHASE FOUR

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	% of TASK COMPLETE
1	Project Conception & Initiation					
1.1	Project Charter	Samuel			#REF!	100%
1.1.1	Project Charter Revisions	Carlos			0	100%
1.2	Research	Carlos			0	90%
1.3	Projections	Danielle			0	40%
1.4	Stakeholders	Liliana			0	70%
1.5	Guidelines	Berenice			0	60%
1.6	Project Initiation	Berenice			0	50%
2	Project Definition & Planning					
2.1	Scope & Goal Setting	Danielle			0	5%
2.2	Budget	Liliana			0	30%
2.3	Communication Plan	Berenice			0	0%
2.4	Risk Management	Berenice			0	0%
3	Project Launch & Execution					
3.1	Status & Tracking	Danielle			0	0%
3.2	KPIs	Samuel			0	0%
3.2.1	Monitoring	Carlos			0	0%
3.2.2	Forecasts	Carlos			0	0%
3.3	Project Updates	Danielle			0	0%
3.3.1	Chart Updates	Berenice			0	0%
4	Project Performance / Monitoring					
4.1	Project Objectives	Danielle			0	0%
4.2	Quality Deliverables	Liliana			0	0%
4.3	Effort & Cost Tracking	Berenice			0	0%
4.4	Project Performance	Berenice			0	0%

WEEK 1 | WEEK 2 | WEEK 3 | WEEK 4 | WEEK 5 | WEEK 6 | WEEK 7 | WEEK 8 | WEEK 9 | WEEK 10 | WEEK 11 | WEEK 12

M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F M T W R F


Blue Ridge Community College District
organization chart
Board of Education
Superintendent
Deans
Director of Business Services
Director of Human Resources
Technology Coordinator
Building Secretary
Facilities Management
Procurement Department
Human Resources Specialist
Data Management & Security
Assistant Principal
Assistant Administrators
Infrastructure Management
Support Staff
Finance department
Public Records Assistant
Technology Services
Communications Coordinator
Hardware Support
Help Desk Operations
Payroll Coordinator
Software Management
Training & Professional Development
Professors
Building & Grounds Director
Network administration


Thank you