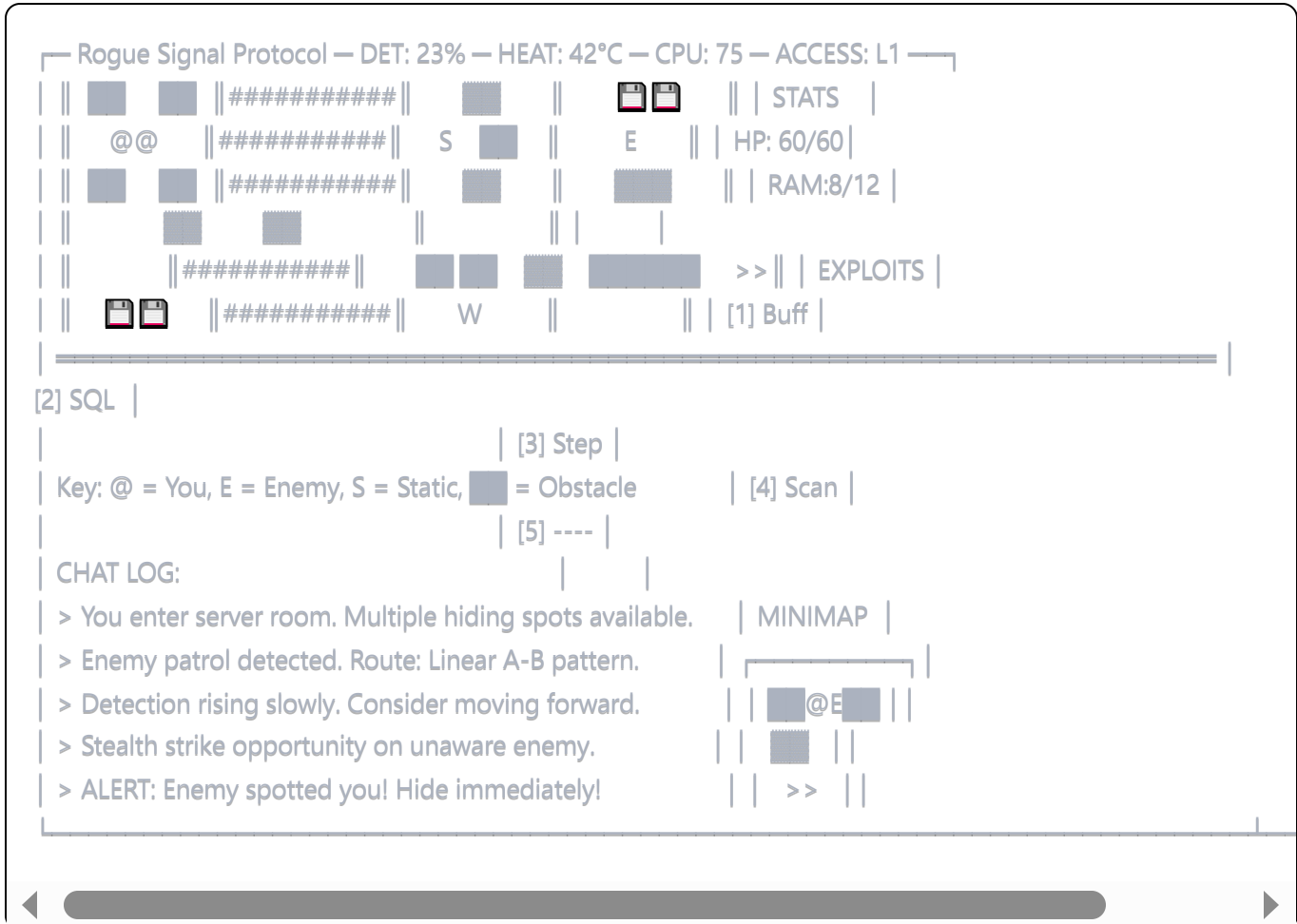


Static UI Layout (Launch Version)

Main Game Screen - Fixed Information Display



Chat Log Color Coding:

- **White:** General information and movement
- **Green:** Positive events (stealth opportunities, loot found)
- **Yellow:** Warnings (detection rising, enemy alerts)
- **Red:** Danger (spotted by enemy, high detection)
- **Blue:** System messages (exploit usage, access gained)

Fixed UI Elements:

- **Top bar:** Core stats always visible
- **Right panel:** Character stats, loaded exploits, minimap
- **Bottom area:** Chat log with scrolling message history
- **Main area:** Game grid with clear legend

- **No context switching:** All information always available

Rendering System

Three Rendering Modes:

- **ASCII Mode:** Traditional text-based display using console fonts
- **Graphics Mode:** 64x64 pixel sprites rendered through tcod tileset
- **Hybrid Mode:** ASCII gameplay with graphical UI elements and effects

Hybrid Mode Features:

- **ASCII grid:** Character-based game area for crisp clarity
- **Graphical UI:** Sprite-based health bars, buttons, icons
- **Effect overlays:** Graphical vision ranges, patrol routes, alerts
- **Best of both:** Performance of ASCII with visual polish of graphics

Sprite Sheet Implementation (64x64 pixels)

Sprite Categories and Entity Lists:

Player Classes (Row 0: 7 sprites)

0: Script Kiddie 4: Admin Impersonator
1: Ghost Protocol 5: Zero Day
2: Battle Hacker 6: (Reserved)
3: Data Archaeologist
4: Quantum Infiltrator

Basic Enemies (Row 1: 8 sprites)

0: Ping Scanner 4: Log Process
1: Spam Bot 5: Firewall Daemon
2: IDS Monitor 6: Antivirus
3: SIEM Correlator 7: (Reserved)

Advanced Enemies (Row 2: 6 sprites)

0: Hunter-Killer 3: Honeypot
1: Admin Avatar 4: (Reserved)
2: Security Drone 5: (Reserved)

Environment Tiles (Rows 3-4: 32 sprites)

Row 3: Walls and Barriers (16 variants)

0-3: Wall corners and edges

4-7: Data clusters (different orientations)

8-11: Doors and gates

12-15: Network barriers and firewalls

Row 4: Network Elements and Interactive (16 variants)

0-3: Floor tiles (clean, corrupted, special)

4-7: Processing cores and network nodes

8-11: Terminals and access points

12-15: Special network markers

Items and Loot (Rows 5-6: 32 sprites)

Row 5: Data Patches and Scripts (16 sprites)

0-5: Data patch colors (Crimson, Azure, Emerald, Golden, Violet, Silver)

6-11: Runtime script variants

12-15: CPU cycles and memory modules

Row 6: Equipment and Special (16 sprites)

0-3: Admin credentials and access cards

4-7: Cooling units and hardware

8-11: Exploit templates and tools

12-15: Special quest items

Effects and UI (Rows 7-8: 32 sprites)

Row 7: Combat and Status Effects (16 sprites)

0-3: Vision range indicators

4-7: Alert states (green, yellow, red enemy states)

8-11: Explosion and damage effects

12-15: Heat and detection indicators

Row 8: UI Elements (16 sprites)

0-3: Health and status bars

4-7: Button states and borders

8-11: Icons for different stats

12-15: Special UI decorations

Sprite Organization Benefits:

- **Logical grouping:** Related sprites in same rows
- **Easy expansion:** Empty slots for future content
- **Consistent sizing:** All 64x64 for uniform scaling
- **Memory efficient:** Single sheet load for all game graphics# Rogue Signal Protocol - Traditional Roguelike Design Document v4.0

Network Dungeon Crawler with Advanced Stealth

Executive Summary

Rogue Signal Protocol is a stealth-focused traditional roguelike where you play as a hacker's consciousness trapped in cyberspace. Navigate procedurally generated network dungeons using stealth, observation, and tactical combat. Each "floor" is a network system, each "room" is a subnet, and each "monster" is a security process with distinct patrol patterns and vision cones. Master enemy movement patterns, hide in shadows, and strike from stealth - or face the terrifying Admin Avatar hunting you through the network.

Core Gameplay Loop

Stealth-First Roguelike Structure

- **Movement:** Grid-based, 8-directional movement (FREE and SILENT)
- **Stealth:** Observe patrol patterns, avoid vision cones, hide in shadows
- **Combat:** Bump-to-attack OR stealth attacks for bonus damage
- **Time:** Turn-based, everything moves when you do
- **Death:** Permanent, start over from Network 1
- **Progression:** Find better exploits, upgrade stealth gear, descend deeper

The Network as Stealth Dungeon

Traditional Roguelike → Rogue Signal Protocol Translation

Traditional Roguelike	Rogue Signal Protocol
Dungeon Floor	Network System
Room	Server/System Node
Corridor	Network Connection
Monster	Security Process (with vision/patrol)
Treasure	Exploit/Data (often guarded)
Stairs Down	Gateway Router (heavily guarded)
Potion	Data Patch (randomized effects)
Scroll	Runtime Script (randomized one-use exploits)
Weapon	Persistent Attack Exploit
Armor	Stealth Enhancement/Defense
Food/Hunger	Detection System (Security Pressure)
Light/Dark	Network Security Coverage

Stealth System

Vision and Detection - Simplified

Enemy Vision Mechanics:

- Each enemy has a circular vision range (3-8 squares radius)
- Enemies see in all directions (360° vision)
- Walls and obstacles block line of sight
- **Seen/Not Seen:** Binary stealth state - you're either detected or you're not
- No complex stealth percentages or shadow zones

Enemy Color States:

- **Green:** Enemy unaware of your presence
- **Yellow:** Enemy can see you but hasn't reported yet (1 turn to hide)
- **Red:** Enemy actively tracking you and has alerted nearby enemies

Alert System: When spotted by an enemy:

1. Enemy turns **Yellow** for 1 turn (grace period)
2. If still visible, enemy turns **Red** and alerts nearby enemies (5 square radius)
3. Alerted enemies move toward your last known position

4. Alert status fades after 10 turns if you break line of sight

Vision Range Display:

. = Empty space @ = You (hidden)
E = Enemy ! = You (spotted)
■ = Vision area # = Wall/Obstacle
░░░ = Blocked vision

Example Vision Range:

```
.....  
■ ■ ■ ■ ■ ■ ■ ■ ■ ■  
.....  
■ ■ ■ ■ ■ E ■ ■ ■ ■  
.....  
■ ■ ■ ■ ■ ■ ■ ■ ■ ■  
.....
```

Enemy Behavior and Patrol Patterns

Patrol Types:

Linear Patrol (L):

- Route: $A \rightarrow B \rightarrow A \rightarrow B$
- Behavior: Predictable, easy to time
- Examples: Basic scanners, log processes

Circular Patrol (C):

- Route: $A \rightarrow B \rightarrow C \rightarrow D \rightarrow A$
- Behavior: Moderate timing challenge
- Examples: IDS monitors, security daemons

Random Walk (R):

- Route: Unpredictable movement
- Behavior: Hard to predict, requires patience
- Examples: Spam bots, corrupted processes

Static Guard (S):

- Route: No movement, constant 360° vision

- Behavior: Guards doorways and treasures
- Examples: Firewalls, admin terminals

Hunter Patrol (H):

- Route: Seeks last known player position
- Behavior: Investigates disturbances
- Examples: Antivirus, hunter-killers

Grid-Based Network Layout

Network Generation with Stealth Elements

Each network is a 50x50 grid optimized for stealth gameplay and reasonable screen coverage.

Room Design with Network Obstacles

Network-Based Cover System: Rooms contain various virtual network constructs that block line of sight, creating tactical hiding opportunities:

- **Data Clusters:** 2x1 rectangular data storage nodes
- **Processing Cores:** 1x1 square computational units
- **Network Nodes:** 1x1 routing/switching points that provide 360° cover
- **Firewall Stacks:** 1x2 security barrier constructs
- **Traffic Shapers:** Partial network segments creating maze-like data flows

Example Room Layouts:

Server Farm with Data Clusters:

```
#####
# █ █ █ █ # █ = Data clusters (2x1)
#  S  E  # S = Static guard
# █ █ █ █ # E = Patrol enemy
#      @ # @ = Player
# █ █ █ █ # Multiple hiding spots
#####
```

Processing Center with Network Nodes:

Movement & Combat Controls

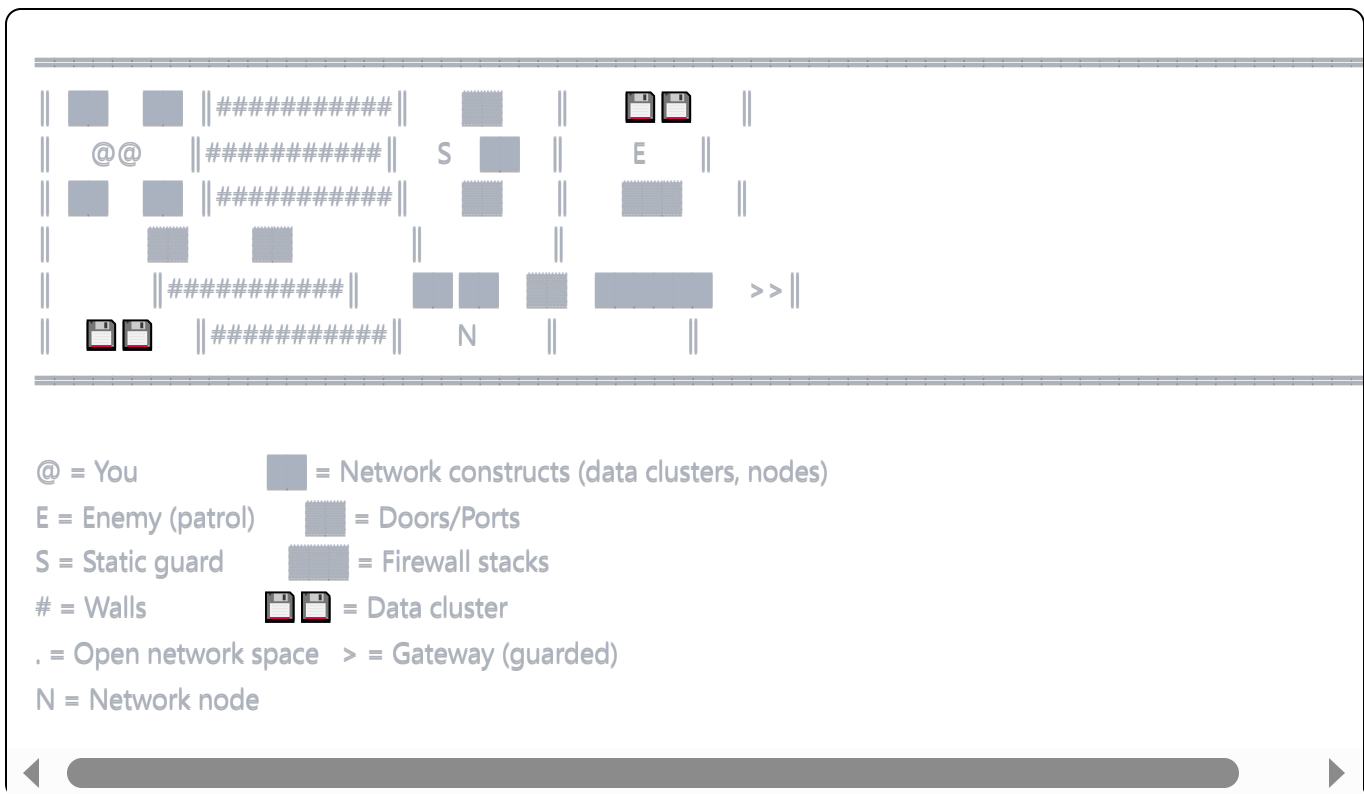
- **Arrow keys/WASD/Numpad:** Normal movement (silent by default)
- **Space/5:** Wait and observe (watch enemy patterns)
- **Tab:** Show/hide enemy patrol routes

- **Bump into enemy:** Melee attack (adjacent range)
- **Number keys 1-9:** Activate ranged exploits
- **R:** Reload/refresh exploit loadout

- **Melee exploits** (Range 1): Buffer Overflow, Stealth Kill
- **Short-range exploits** (Range 3): SQL Injection, Data Corruption
- **Long-range exploits** (Range 5+): Port Scan, Network Probe

- **Stealth Strike:** Attack an unaware enemy from any range within your exploit's reach
- **Damage Bonus:** 2x damage when attacking unaware enemies
- **Silent Kills:** Enemies with $\leq 50\%$ HP die silently from stealth strikes
- **Alert Prevention:** Successful stealth kills don't trigger enemy alerts

Example Stealth-Focused Network Layout:



Controls

- **Arrow keys/WASD/Numpad:** Normal movement (silent)
- **Space/5:** Wait and observe enemy patterns
- **Tab:** Toggle patrol route display
- **Number keys 1-9:** Use loaded exploits
- **I:** Open inventory screen
- **R:** Reload exploit loadout

Player Vision System

Limited Vision Range: Player can see 15 squares in all directions, creating fog of war beyond that range. This:

- **Encourages exploration** and careful movement
- **Increases tension** when approaching unseen areas
- **Makes enemy positioning** more tactical
- **Balances information** - can't see entire level at once

Vision Blocking: Walls and large obstacles block player vision just like enemy vision.

Consumables System - Randomized Effects

Data Patches (Potion Equivalent)

Data patches are single-use system repairs that appear with randomized colors and effects. Each run randomizes which color corresponds to which effect, creating traditional roguelike identification gameplay.

Data Patch Colors (Randomized Each Run):

- **Crimson Data Patch**
- **Azure Data Patch**
- **Emerald Data Patch**
- **Golden Data Patch**
- **Violet Data Patch**
- **Silver Data Patch**

Data Patch Effects (6 Types):

1. **Integrity Restore:** Heal 30-50 HP instantly
2. **Overclock Boost:** +25% movement speed for 20 turns
3. **Stealth Enhancement:** -50% detection chance for 15 turns
4. **Heat Sink:** Reduce heat by 40°C instantly
5. **CPU Surge:** Gain 50-75 CPU cycles
6. **Detection Scrub:** Reduce detection level by 15%

Identification System:

- Unknown patches show as "Mysterious [Color] Data Patch"
- Use one to learn the effect for that color
- Effects stay consistent throughout the run
- Can be identified with advanced scan exploits

Runtime Scripts (Scroll Equivalent)

One-use executable scripts with randomized names and powerful temporary effects. Script names are procedurally generated each run.

Script Descriptor Format: [Adjective] [Function] [Object Type]

- **Example:** "Recursive Memory Optimizer", "Phantom Process Killer", "Distributed Cache Cleaner"

Script Name Components (Randomized): Adjectives: Recursive, Phantom, Distributed, Quantum, Neural, Adaptive, Stealth, Shadow, Ghost, Viral, Encrypted, Compressed

Functions: Memory, Process, Cache, Network, Security, Data, Signal, Protocol, Thread, Buffer, Stack, Heap

Object Types: Optimizer, Killer, Cleaner, Scanner, Injector, Decoder, Compiler, Fragmenter, Multiplexer, Analyzer

Runtime Script Effects (6 Types):

1. **Quantum Tunneling Protocol:** Instantly move to any visible location
2. **Temporal Suspension Matrix:** Stop all enemies for 8 turns
3. **Digital Camouflage Suite:** Complete stealth for 12 turns
4. **Chaos Propagation Virus:** Randomize all enemy patrol routes for 25 turns
5. **Electromagnetic Pulse Wave:** Disable all electronics in large radius for 10 turns
6. **System Override Daemon:** All abilities cost no heat for 15 turns

Script Examples by Run:

Run #1:

"Recursive Memory Optimizer" = Teleport Script
"Phantom Process Killer" = Freeze Script
"Distributed Cache Cleaner" = Invisibility Script
"Quantum Network Scanner" = Confusion Script
"Neural Security Injector" = EMP Script
"Adaptive Data Decoder" = Overclock Script

Run #2:

"Stealth Protocol Fragmenter" = Freeze Script
"Ghost Buffer Multiplexer" = EMP Script
"Encrypted Thread Analyzer" = Teleport Script
"Shadow Signal Compiler" = Invisibility Script
"Viral Heap Optimizer" = Overclock Script
"Compressed Stack Killer" = Confusion Script

Identification and Discovery:

- Scripts show full randomized names but effects are unknown
- Use one to learn what that named script does
- Same script names always have same effects within a run

- Advanced exploits can reveal script functions before use
- Can find "Script Documentation" items that identify multiple scripts

Visual Design:

- Data patches glow with their respective colors
- Scripts appear as glowing code fragments with scrolling text
- Identified items show effect tooltips
- Unknown items show "???" for effects

Level 1 Enemies (DMZ Network)

Ping Scanner (p):

- HP: 20 | Damage: 5 | CPU Reward: 30
- Vision: 3 squares radius, 360° coverage
- Patrol: Linear (A→B→A, 8 turns per cycle)
- Behavior: Basic patrol, predictable timing
- Stealth Notes: Easy to avoid, time movement between positions
- Detection: +3% when killed, +1% when alerted

Spam Bot (s):

- HP: 10 | Damage: 3 | CPU Reward: 20
- Vision: 2 squares radius, 360° coverage
- Patrol: Random walk (changes direction every 3-5 turns)
- Behavior: Unpredictable movement, frequent direction changes
- Stealth Notes: Hard to predict, requires patience
- Detection: +2% when killed, +1% when spotted

Log Process (l):

- HP: 30 | Damage: 2 | CPU Reward: 40
- Vision: 4 squares radius, 360° coverage
- Patrol: Static guard (no movement)
- Behavior: Monitors fixed position, excellent vision range
- Stealth Notes: Can be avoided with careful positioning
- Detection: +5% when killed, +3% when it spots you

Level 2 Enemies (Corporate Network)

Firewall Daemon (F):

- HP: 50 | Damage: 8 | CPU Reward: 60
- Vision: 3 squares radius, 360° coverage
- Patrol: Static guard (no movement)
- Behavior: Guards doorways and treasures
- Stealth Notes: Must be disabled or bypassed, constant coverage
- Special: Reduces damage by 50%, requires special tactics
- Detection: +8% when killed, +5% when approached

Antivirus (A):

- HP: 40 | Damage: 10 | CPU Reward: 50
- Vision: 4 squares radius, 360° coverage
- Patrol: Hunter (seeks disturbances)
- Behavior: Investigates last known player position
- Stealth Notes: Will hunt you if spotted, difficult to lose
- Special: Can disable one exploit, calls backup if you escape
- Detection: +6% when killed, +10% if it hunts you

IDS Monitor (I):

- HP: 35 | Damage: 5 | CPU Reward: 45
- Vision: 5 squares radius, 360° coverage (excellent range)
- Patrol: Circular (complex route, 12 turns per cycle)
- Behavior: Professional patrol pattern
- Stealth Notes: Large vision range, requires careful timing
- Special: Summons backup when hurt, increases detection
- Detection: +10% when killed, +15% when it calls backup

Level 3+ Enemies (Deeper Networks)

Hunter-Killer (H):

- HP: 60 | Damage: 15 | CPU Reward: 80

- Vision: 6 squares radius, 360° coverage (massive range)
- Patrol: Aggressive hunter (moves toward last disturbance)
- Behavior: Relentless pursuit, moves twice per turn
- Stealth Notes: Extremely dangerous if spotted, avoid at all costs
- Special: Tracks footprints for 5 turns, immune to distractions
- Detection: +12% when killed, +20% when it starts hunting

SIEM Correlator (S):

- HP: 45 | Damage: 8 | CPU Reward: 70
- Vision: 4 squares radius, 360° coverage
- Patrol: Static guard (no movement)
- Behavior: Central room guardian, enhances other enemies
- Stealth Notes: Must be carefully avoided or disabled
- Special: All enemies in room get +5 damage and +1 vision range
- Detection: +15% when killed, enables other enemies to see further

Admin Avatar (BOSS):

- HP: 200 | Damage: 30 | CPU Reward: 150
- Vision: 8 squares radius, 360° coverage (sees everything)
- Patrol: Intelligent hunting (pathfinds toward player)
- Behavior: Only spawns at 100% detection, hunts relentlessly
- Stealth Notes: Cannot be hidden from, must reach exit while evading
- Special: Sees through stealth, summons reinforcements, deletes exploits
- Detection: Only spawns at 100% detection level

Honeypot (h):

- HP: 20 | Damage: 0 | CPU Reward: 100
- Vision: 0 squares (appears as treasure)
- Patrol: Static (disguised as loot)
- Behavior: Pretends to be valuable data
- Stealth Notes: Can be identified with scan exploits
- Special: +30% detection if killed, but reveals hidden areas

- Detection: +30% when killed (major spike but rewards exploration)

Special Abilities (Exploits) - Stealth Enhanced

Exploit System

- **Number Keys 1-9:** Activate loaded exploits
- **RAM Limitation:** Can only load 12 GB worth at once
- **Heat System:** Powerful exploits generate heat instead of cooldowns
- **Quick Swap:** Press 'I' to instantly swap loaded/stored exploits
- **Stealth Synergy:** Many exploits have stealth bonuses

Stealth Exploits (New Category)

Rootkit (1):

- RAM: 2 GB
- Heat Generated: +25°C
- Effect: Invisible for 10 turns, immune to vision detection
- Stealth: Can move through enemies, backstab bonus +100%
- Heat: Breaks if you attack or use loud exploits
- Synergy: Move while rooted to cool down faster

Shadow Step (2):

- RAM: 2 GB
- Heat Generated: +20°C
- Range: Any shadow zone within 8 squares
- Effect: Teleport between shadow zones silently
- Stealth: No detection chance, can escape pursuit
- Heat: Moderate cost for positioning advantage

Data Mimic (3):

- RAM: 1 GB
- Heat Generated: +15°C
- Effect: Appear as harmless data packet for 5 turns
- Stealth: Enemies ignore you completely unless bumped

- Heat: Low cost disguise for crossing danger zones

Noise Maker (4):

- RAM: 1 GB
- Heat Generated: +10°C
- Range: 6 squares
- Effect: Create distraction sound at target location
- Stealth: Redirects enemy attention, no detection increase
- Heat: Essential tool for creating openings

Ghost Protocol (5):

- RAM: 3 GB
- Heat Generated: +35°C
- Effect: Phase through walls for 3 turns
- Stealth: Access secret areas, escape when cornered
- Heat: High cost emergency escape

Combat Exploits (Stealth Enhanced)

Buffer Overflow (6):

- RAM: 2 GB
- Heat Generated: +20°C (+10°C if used from stealth)
- CPU Cost (Optional): 15 to Overclock for 2x damage
- Range: Adjacent
- Effect: 50 damage + (Access_Level * 10), armor piercing
- Stealth: 2x damage if enemy unaware, silent kill if enemy ≤ 50 HP

SQL Injection (7):

- RAM: 1 GB
- Heat Generated: +15°C (silent attack)
- Range: 3 squares
- Effect: 35 damage + (Access_Level * 5), bypasses firewalls
- Stealth: No detection increase if used from stealth
- Heat: Perfect for stealth runs

Stealth Kill (8):

- RAM: 2 GB
- Heat Generated: +30°C
- Range: Adjacent (must be unaware enemy)
- Effect: Instant kill on unaware enemies ≤ 75 HP
- Stealth: Must be used on unaware enemies, completely silent
- Heat: High-risk, high-reward stealth option

EMP Burst (9):

- RAM: 3 GB
- Heat Generated: +40°C
- Range: Radius 2
- Effect: Disables all enemies for 5 turns (no damage)
- Stealth: Perfect for escaping without killing
- Heat: Non-lethal crowd control

Utility Exploits (Observation Enhanced)

Port Scanner (Q):

- RAM: 1 GB
- Heat Generated: +10°C (minimal)
- CPU Cost (Optional): 10 for Deep Scan (shows patrol routes)
- Effect: Reveals subnet layout, enemy positions, and vision cones
- Stealth: Essential for planning stealth routes

Packet Sniffer (W):

- RAM: 1 GB
- Heat Generated: +5°C
- Effect: See enemy vision cones permanently for current subnet
- Stealth: Critical intel for stealth gameplay
- Heat: Low cost information gathering

Security Cam Hack (E):

- RAM: 2 GB
- Heat Generated: +20°C
- Effect: Control one enemy's movement for 5 turns
- Stealth: Make enemies face away or move out of position
- Heat: Tactical manipulation tool

Log Wiper (R):

- RAM: 1 GB
- Heat Generated: +5°C (very low)
- Effect: -20% detection level, clears footprints
- Stealth: Essential for maintaining low detection
- Heat: Use freely without overheating

Resources & Stealth Integration

Detection System - Network Security Pressure

DETECTION:  23% / 100%

Detection Heatmap Visualization: Different areas show detection risk through color coding:

- **Green areas:** Low detection risk (0-25%)
- **Yellow areas:** Moderate detection risk (26-50%)
- **Orange areas:** High detection risk (51-75%)
- **Red areas:** Critical detection risk (76-100%)

Passive Detection Increase (Configurable in JSON):

json

```
"detection_rates": {  
  "network_1_dmz": {  
    "base_rate": 20,  
    "description": "+1% every 20 turns (tutorial pace)"  
  },  
  "network_2_corporate": {  
    "base_rate": 15,  
    "description": "+1% every 15 turns (building pressure)"  
  },  
  "network_3_datacenter": {  
    "base_rate": 12,  
    "description": "+1% every 12 turns (standard pressure)"  
  },  
  "network_4_government": {  
    "base_rate": 10,  
    "description": "+1% every 10 turns (high pressure)"  
  },  
  "network_5_backbone": {  
    "base_rate": 8,  
    "description": "+1% every 8 turns (extreme pressure)"  
  }  
}
```

Active Detection Sources:

- Enter enemy vision: +5% per turn observed
- Kill enemy: +5% to +10% depending on type
- Use loud exploits: +10% to +15%
- Enter new room: +2%
- Trigger alarms: +15%
- Failed stealth attempt: +8%

Detection Reduction (Precious Resources):

- Log Wiper exploit: -20% detection
- Complete room undetected: -10% detection
- Find admin credentials: -15% detection
- Use only stealth kills in room: -5% detection
- Data Cleansers (items): -10% to -25% detection

Simplified Detection Effects:

- **0-30%:** 🧘 "Quiet" - Normal enemy behavior
- **31-60%:** 👁 "Alert" - Enemies move 25% faster, +1 vision range
- **61-90%:** 🔍 "Searching" - Hunter-killers spawn, enemies hunt mode
- **91-100%:** 🚨 "Critical" - Admin Avatar spawns and hunts

Effect Notifications: Clear UI messages when detection levels change:

- "Security alert level increased - enemies moving faster"
- "Hunter-killer deployed - avoid at all costs"
- "CRITICAL: Admin Avatar activated"

Stealth UI Elements - Context-Sensitive Display

Proximity-Based Information:

- 👁 **ENEMY VISION:** Only shows when within 6 squares of enemies
- ◇ **SHADOWS:** Only visible when adjacent or inside shadow zones
- ❄ **COOLING:** Only shows when within 3 squares of cooling sources
- 💎 **ITEMS:** Only displays when within pickup range

Status Indicators (Always Visible):

- 🧑 **HIDDEN:** You're in shadows or concealed
- 🎯 **STEALTH STRIKE:** Enemy unaware, can attack for bonus damage
- 👁 **SPOTTED:** Enemy can see you this turn
- 🚨 **ALERTED:** Enemy investigating your area

Smart Warnings (Context-Triggered):

- ⚠ **OVERHEATING:** Only when heat >75°C
- 🚨 **DETECTION SPIKE:** Only when detection rises >5% in one turn
- 🏃 **PRESSURE:** Only when background detection building for 5+ turns
- 💡 **OPPORTUNITY:** Only when stealth advantage appears

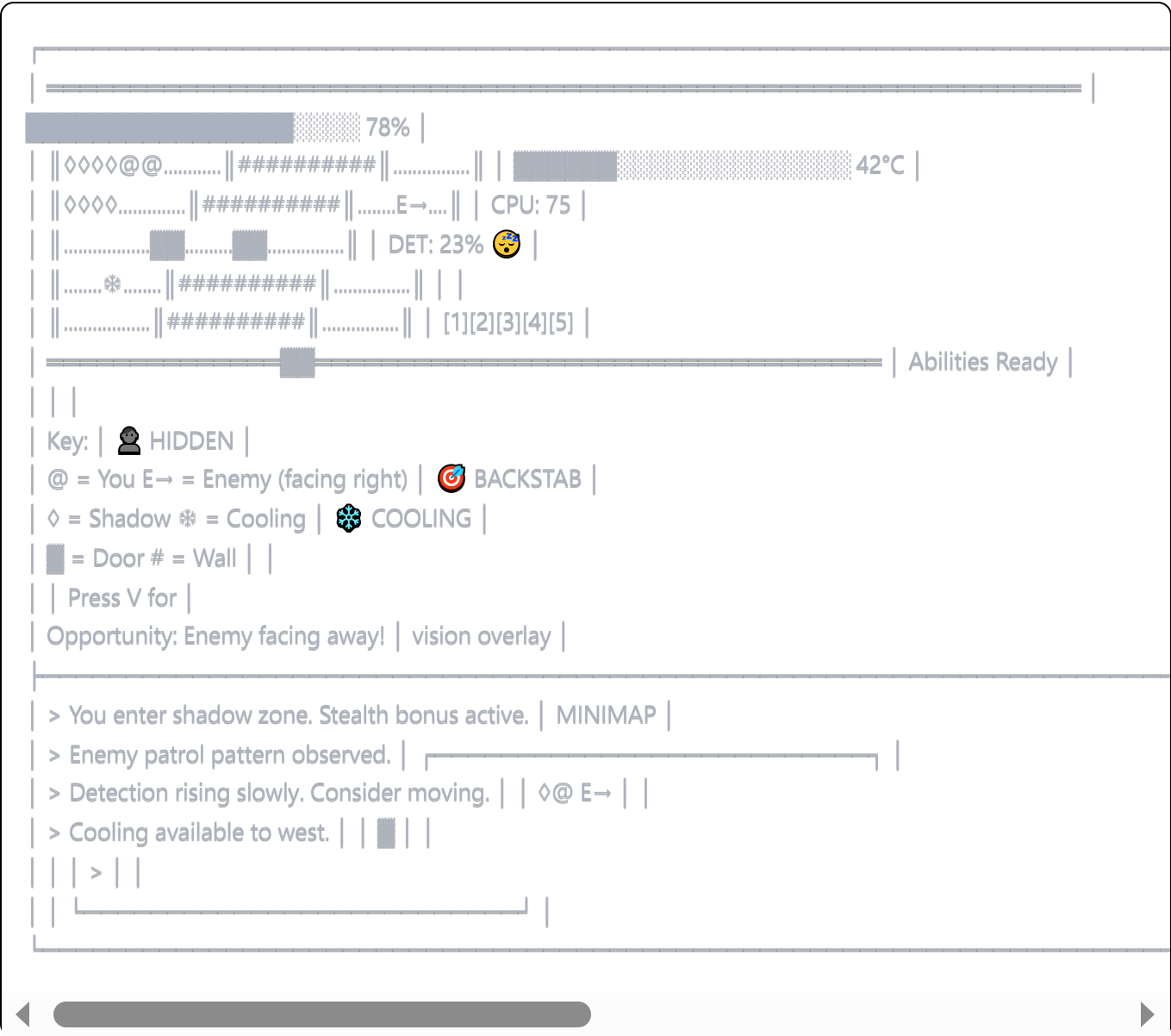
Vision Overlay (V Key - Temporary):

- Shows all enemy vision ranges as circular areas
- Displays patrol prediction for next 3 turns

- Highlights safe movement paths
- Auto-hides after 5 seconds or key press

Simplified UI Layout

Main Game Screen - Clean Information Hierarchy










Vision Overlay (V Key) - Temporary Full Information



Smart Contextual Warnings

Context-Sensitive Alerts (Only When Relevant):

-  **DETECTION SPIKE:** When detection increases >5% in one turn
-  **OVERHEATING:** When heat >75°C
-  **OPPORTUNITY:** When backstab chance appears
-  **SPOTTED:** When enemy sees you
-  **COOLING:** When cooling source nearby
-  **CLEANSER:** When detection reducer found
-  **PRESSURE:** When background detection building up

Simplified Visual Language

Color-Coded Information Priority

RED = Immediate Danger

- Overheating warnings
- Enemy vision when you're exposed
- Critical detection spikes

YELLOW = Caution/Attention

- Rising heat levels
- Background detection increases
- Patrol warnings

GREEN = Opportunity/Safety

- Shadow zones
- Cooling sources
- Stealth opportunities
- Safe movement paths



BLUE = Resources/Tools

- CPU pickups
- Exploits ready
- Cleansers available

GRAY = Neutral/Environmental


- Walls, floors, basic terrain
- Inactive elements

Core Symbols (Always Visible):

- @ = Player
- E = Enemy (with facing arrow ←↑→↓)
- ◇ = Shadow (only when adjacent)
- = **Wall**
-  = Door/Port
-  = Exit

- ❄ = Cooling (only when nearby)

Overlay Symbols (Only in vision mode):

-  = Vision cone area
- → = Patrol direction
- ? = Unknown/unexplored
- ! = Threat indicator
- ★ = Opportunity marker

Network Progression (Stealth-Focused)

Network 1: DMZ (Stealth Tutorial)

- **Size:** 70x70
- **Enemies:** 8-12 with simple patrol patterns
- **Shadow Coverage:** 40% (generous for learning)
- **Tutorial Elements:**
 - Introduction to vision cones and patrol timing
 - Safe shadow zones for practice
 - Simple linear patrols to master
- **Stealth Challenges:** None (learning environment)
- **Gateway:** Lightly guarded, teaches doorway bypass

Network 2: Corporate Intranet (Stealth Intermediate)

- **Size:** 70x70
- **Enemies:** 12-16 with mixed patrol types
- **Shadow Coverage:** 30% (more strategic placement)
- **Stealth Challenges:**
 - Circular patrols requiring timing
 - First firewall bypass challenges
 - Multiple enemy coordination
- **Special:** Introduces hunting behavior when spotted

Network 3: Data Center (Stealth Advanced)

- **Size:** 70x70
- **Enemies:** 16-20 with complex behaviors
- **Shadow Coverage:** 25% (must be earned)
- **Stealth Challenges:**
 - Overlapping vision cones
 - Hunter-killers that track movement
 - Treasure rooms requiring perfect stealth
- **Special:** First Admin Avatar warning at 85% detection

Network 4: Government System (Stealth Expert)

- **Size:** 70x70
- **Enemies:** 20-25 with professional patterns
- **Shadow Coverage:** 20% (expert level)
- **Stealth Challenges:**
 - Synchronized patrols blocking all routes
 - SIEM correlators enhancing group vision
 - Air-gapped sections requiring ghost protocol
- **Special:** Admin Avatar threshold lowered to 75%

Network 5: Internet Backbone (Stealth Mastery)

- **Size:** 70x70
- **Enemies:** 15 elite enemies with perfect coverage
- **Shadow Coverage:** 15% (minimal)
- **Stealth Challenges:**
 - Near-perfect enemy coverage
 - Corrupted processes with erratic patterns
 - Time pressure from integrity drain
- **Special:** Admin Avatar spawns at 50% detection
- **Goal:** Reach recovery server while evading the Admin Avatar

UI Design Philosophy - Progressive Disclosure

Core Principle: Show Only What You Need, When You Need It

The game uses progressive disclosure and context-sensitive information to prevent UI overwhelming. Information appears based on player actions and proximity, with clear visual hierarchy.

Information Layers (Toggleable)

Layer 1 - ALWAYS VISIBLE (Essential Info): Core resources, enemy positions, basic terrain

Layer 2 - PROXIMITY BASED (Auto-Show):

- Enemy vision cones (only when within 6 squares)
- Shadow zones (only when adjacent or inside)
- Interactive objects (when within 3 squares)

Layer 3 - ON-DEMAND (Player Activated):

- Full vision display (V key - temporary overlay)
- Patrol routes (Tab key on specific enemy)
- Threat analysis (Shift+Tab - danger assessment)

Layer 4 - CONTEXTUAL (Situation Based):

- Detection warnings (only when rising quickly)
- Heat warnings (only above 50°C)
- Stealth opportunities (only when enemy vulnerable)

Progressive Tutorial Integration

Information Introduction Sequence

Network 1 Tutorial Progression:

Turn 1-10: Basic movement and terrain

- Show only: Player, walls, basic movement
- Message: "Move with arrow keys. Find the exit >"

Turn 11-20: Enemy introduction

- Show: First enemy, basic vision indication
- Message: "Enemies can see you. Avoid their gaze."

Turn 21-30: Shadow system

- Show: Shadow zones when approached
- Message: "◇ symbols are shadows. Hide here for safety."

Turn 31-40: Detection concept

- Show: Detection meter, basic warnings
- Message: "Detection rises over time. Keep moving."

Turn 41+: Advanced features unlocked progressively

- Vision overlay (V key)
- Study system (Tab key)
- Exploit system

Smart Defaults and Auto-Hide

Default UI State (Minimal):

- Core resources visible
- Current subnet layout
- Immediate threats only
- Context-sensitive warnings

Auto-Hide System:

- Vision cones disappear when not relevant
- Patrol routes hide after being learned
- Warnings auto-dismiss after acknowledgment
- Advanced info tucked behind hotkeys

Player Preference Memory:

- Remembers which overlays you use most
- Suggests relevant information based on playstyle
- Adapts warning thresholds to your skill level

Technical Implementation

Engine: Python + tcod

Rogue Signal Protocol will be built using Python with the tcod library for the core roguelike engine, providing both ASCII and optional graphical modes.

Core Libraries:

- **tcod (python-tcod)**: Main roguelike engine, handles input, rendering, FOV, pathfinding
- **numpy**: Fast array operations for map generation and calculations
- **pygame** (optional): Audio system and advanced input handling
- **PIL/Pillow**: Sprite sheet processing and image manipulation
- **json**: Save/load system and configuration files

Rendering Modes:

- **ASCII Mode**: Traditional roguelike text display using tcod console
- **Graphics Mode**: Custom sprite sheets rendered through tcod's tileset system
- **Hybrid Mode**: ASCII with graphical overlays for UI elements

Sprite Sheet Implementation:

- **Format**: PNG sprite sheets generated with Stable Diffusion
- **Tile Size**: 16x16 or 32x32 pixels per sprite
- **Organization**: Organized grids with consistent positioning
- **Categories**:
 - Characters (player classes, enemies)
 - Environment (walls, floors, shadows, electronics)
 - Items (data patches, scripts, equipment)
 - Effects (vision cones, detection indicators, heat signatures)
 - UI Elements (icons, borders, status indicators)

Graphics System Design:

- **Fallback Support**: Game fully playable in ASCII if graphics fail to load
- **Hot-swappable**: Players can switch between ASCII/graphics in settings
- **Modular Assets**: Each sprite category loads independently
- **Memory Efficient**: Sprite sheets loaded on demand, cached intelligently
- **Color Variants**: Support for recoloring sprites for different states/types