

RSA[®]Conference2016

San Francisco | February 29 – March 4 | Moscone Center

SESSION ID: SPO2-T10

Threat Modeling the Minecraft Way



Connect **to**
Protect

Jarred White

Security Architect,
VMware AirWatch

John Britton

Director, Product Marketing – EUC
Security, VMware



#RSAC



Agenda

- Why Minecraft?
- Environment Requirements
- Threat Profiles
- Building Blocks
- Threat Modeling





Why Minecraft?

- Capacity for creativity and expansion of ideas through direct environmental manipulation
- Consequences for “bad security” through poor design/implementation
- Encourages approaching problems from many dimensions
- Creates an intuitive awareness of security
- Mining!





Environment Requirements

Security

- Feeding yourself
- Protecting yourself/assets
- Storage and shelter
- Light

Performance

- Get around safely and quickly
- Shelters, travel paths, mining must be practical

User Experience

- Convenient access to resources
- Access to different biomes
- Free to explore



Security

Sweet, sweet diamonds





Security

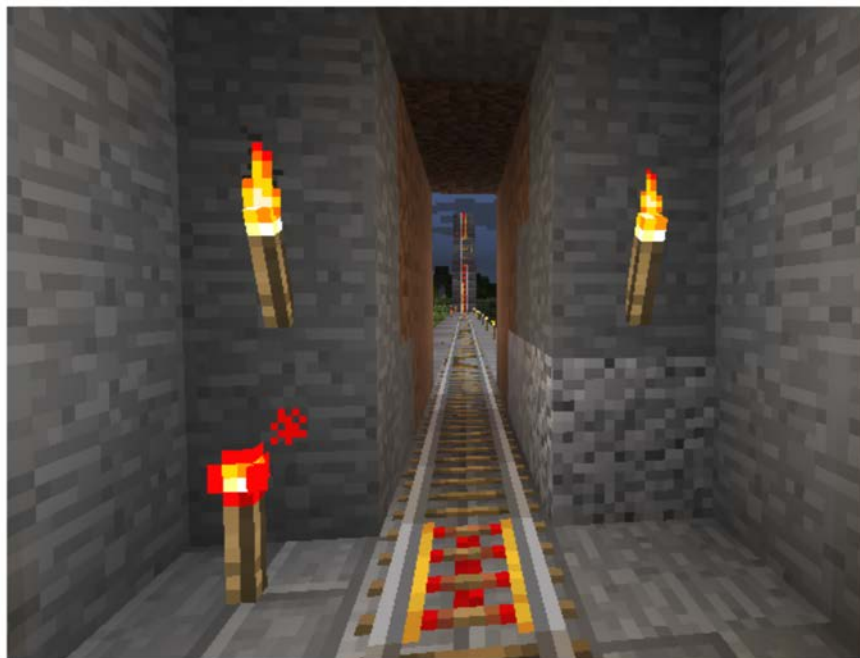
Food, farms, and livestock



Security

Shelter, infrastructure, and
worksites





Performance

Efficient transportation

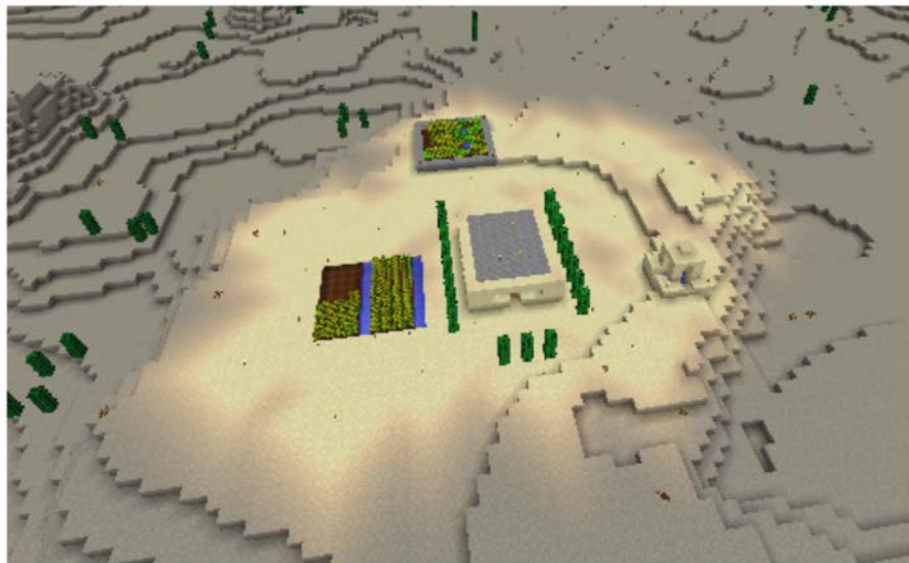




User Experience

Permanency





User Experience

Exploration





About our environment

■ Threats to survival

■ Monsters



■ Lava

■ Falling to your death

■ Starving

■ Getting lost

■ Other players

■ Hubris





Threat Profiles

Creepers



Properties:

- Denial of service
- Remote access



Threat Profiles

Skeletons

Properties:

- Remote code execution
- Race condition
- Remote access



Threat Profiles

Zombies

Properties:

- Buffer overflow
- Remote access
- Virus
- Brute force





Threat Profiles

Spiders

Properties:

- Remote access
- Backdoor



Building blocks

- Blocks
 - Free-form construction using blocks of varying strengths/properties
 - No physics implications for most blocks (exceptions: sand, gravel)
 - Blocks resist explosion (from Creepers, TNT) as well as harvesting (e.g., with a pick axe)
 - Some blocks make better building materials than others
 - Also wear tools at faster rates when harvesting
- Fencing/gates
 - Wood, stone
 - Stackable
- Used for perimeter security, slowing down attackers
 - Skeletons can shoot over! Spiders can crawl over!

Building blocks



#RSAC



Building Blocks



#RSAC



- Organized by relative resistance to explosion/mining
- Good structural materials: Cobblestone, Stone, Stone Brick
- Varying degree of difficulty to harvest



Threat Modeling

■ Architecture

Subhead if needed













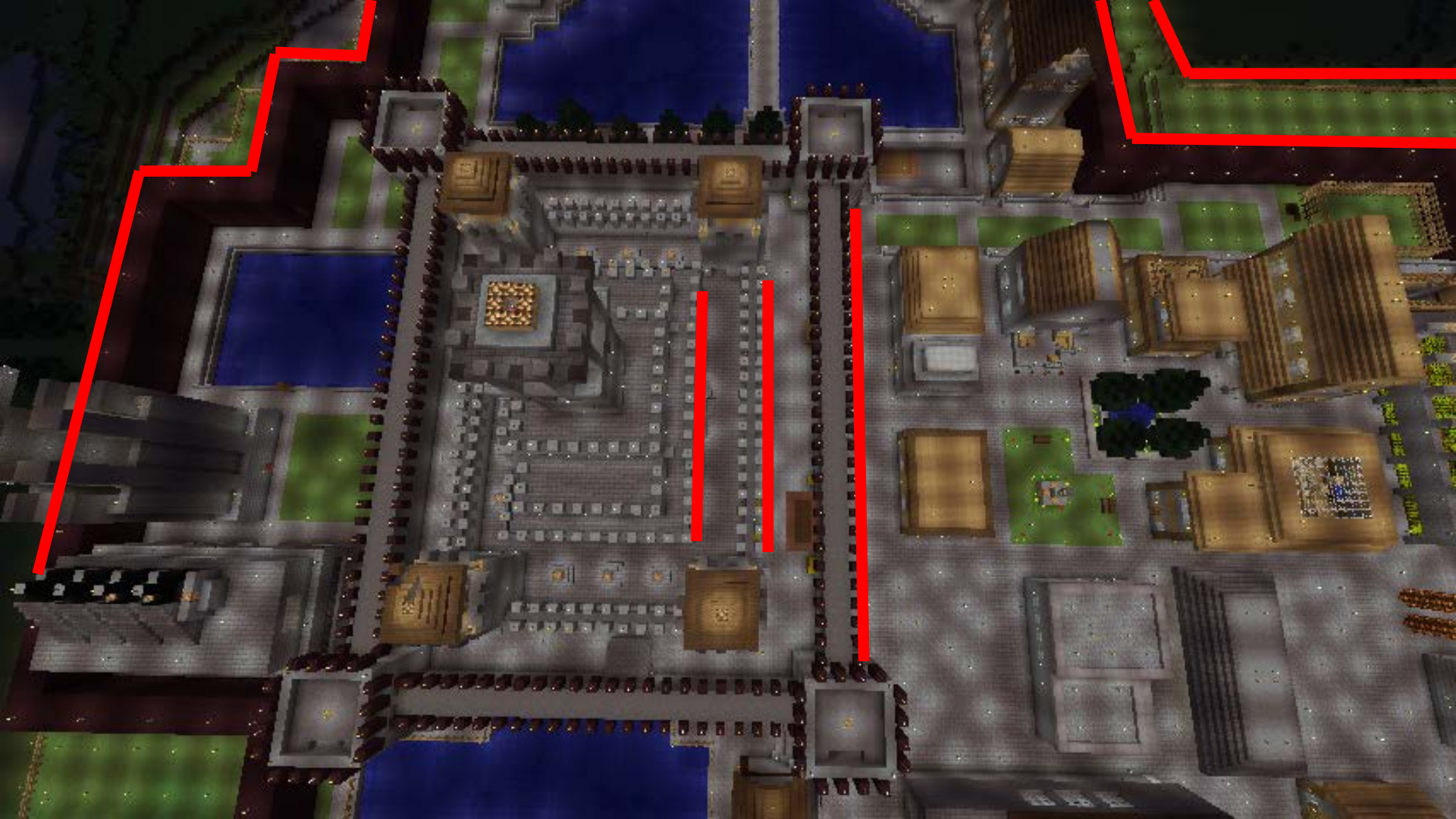


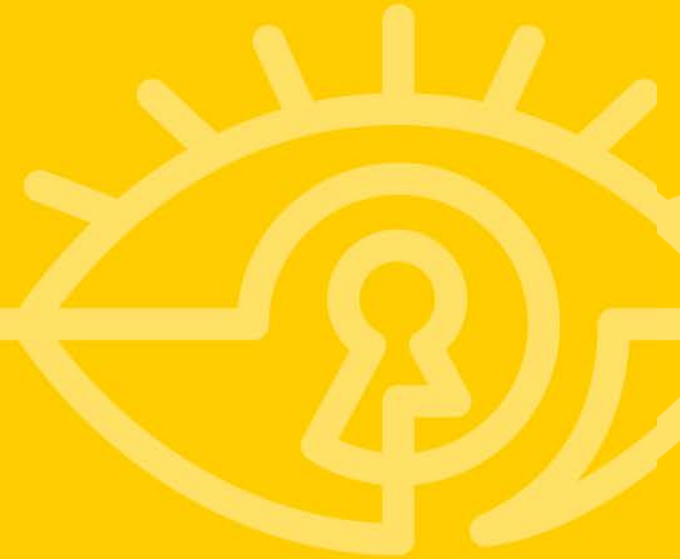


You are here

1 every 5 blocks gridded out








Threat Modeling

■ Storage

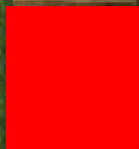
Subhead if needed



Hi!!!!!!!

A Minecraft game scene featuring two wooden chests with black metal bands and silver latches, placed on a cobblestone floor. In the background, a Creeper stands near some green bushes and a yellow flower. The terrain is composed of dirt and stone blocks under a blue sky with white clouds.







3rd level

2nd level

Ground







Threat Modeling

■ Transport

Subhead if needed









20 blocks







Threat Modeling

- Observations
 - **Lighting vulnerabilities are easy to overlook and very costly from a security standpoint**
 - e.g., Creeper spawning in a dark corner
 - **Layered approach is useful for reducing threats but does not permanently eliminate**
 - Perimeter landscaping and fencing/walling
 - Easy to miss landscaping vulnerabilities
 - **Few “single solutions” to all attack types**
 - We covered 4/15 monsters and 1/2 “worlds”
 - **Efficiency + Security is expensive**
 - Railroad materials: Gold, iron, redstone, wood, stone
 - Can exchange food for these properties in some circumstances
 - Defenses centered around monsters only – not other players!
 - Obfuscation comes into play



Challenge

- Go play Minecraft!
 - Get a group together
 - Cheap server requirements
 - Set some goals
 - Functional rail system
 - Parliament
 - Automated foundry
 - Giant mobile phone
 - Who cares?!
 - Now work toward the goals (you know, just play the game)
 - You'll experience all the scenarios we discussed first-hand (and more)
 - Limit yourself by not using cheats/admin hacks
 - Consider adding a "DM" to make things interesting
 - Change conditions on the fly
 - Introduce attackers