

# Checkmate

## Quality Assurance Presentation II



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# Agenda

## ▶ System Status

- Recap
- Update: Requirements Change

## ▶ Quality Assurance Strategy and Framework

- Testing Strategy
- Framework

## ▶ Quality Assurance Report

- Test Run Comparisons
- Bug Status Comparisons
- Test Description: UUnit

## ▶ Deployment

- Methods – current and future
- Issues

## ▶ Project Plan

- Tasks Remaining
- Gantt Chart

# Recap

## ▶ Checkmate is...

- A First-Person Shooter game
- Designed for up to 32 people to play over the Internet or a Local Area Network
- Team-based
- Class-based
- A modification of an existing game
  - ▶ Unreal Tournament 2003

## ▶ Uses a client-server architecture

# Recap

## ► How the game is played:

- 2 Teams: White vs. Black
- First player to join a team becomes the team's *King*
- All other players start as *Pawns*
- Rounds are won by eliminating the other team's King
- Players accumulate *credits* by fragging players from the other team
  - Uses a ratio system:
    - **creditsAwarded = ceiling (enemyClassValue / yourClassValue)**
- Credits can be used to change *player classes* , according to the point value of the unit in chess
  - Pawn=1, Knight=3, Bishop=3, Rook=5, Queen=9, King=10
- The team to win the most rounds at the end of a certain time period is declared the winner of the match










# Update

## ► Requirements Change

- R25: King will be able to give voice commands (via the command menu)
- By default, all players can use the voice command menu included in UT2003
- R25 implied that other players would not have a voice command menu
- After creating and reviewing a prototype, R25 was dropped
- Small change; no effect on the rest of the system
















# QA Strategy & Framework

## ▶ Testing Strategy

- White box 
- Black box 
- Code inspection 
- Scenario-based 
- User Interface 
  - ▶ Heuristic evaluation
  - ▶ Video evaluation
- Ad-Hoc Testing 
- Stress Tests 
- Compatibility Testing 
- Unit Testing 
  - ▶ Scoring/Credit formula



# QA Strategy & Framework

## ► Framework

ID	Type	Name
1	 	Code Inspections
2	 	Ad Hoc Testing
3	 	Operating System Testing
4		Video Tape Analysis
5		Heuristic Evaluation
6		Stress Testing
7		Use Case 1: Server Creation
8		Use Case 2: Players Join a Server
9		Use Case 3: Players Accumulate Points
10		Use Case 4: Select Player Class
11		Use Case 5: Fragging Opposing Team's King
12		Use Case 6: The Match Ends

# QA Strategy & Framework




## ► Framework Cont...

ID	Type	Name
13	 Feature Test: King's Castle Skill	
14	 Feature Test: King's Radar	
15	 Feature Test: King's Ammo Regeneration Aura	
16	 Feature Test: Pawn's Sacrifice Skill	
17	 Feature Test: Bishop's Cloaking Skill	
18	 Feature Test: Rook's Castle Skill	
19	 Feature Test: Rook's Siege Mode	
20	 Feature Test: Queen's Grappling Hook	
21	 Feature Test: Queen's Laser-Guided Rockets	
22	 Feature Test: King's Health on Scoreboard	
23	 Feature Test: King Locator Radar	
24	 Feature Test: Piece Count on King's HUD	



# QA Strategy & Framework

## ► Framework Cont...

ID	Type	Name
25		Interface Scalability Test
26		Accessed None Checks
27		awardCredit Unit Test

# QA Report

## ► Test Run Comparisons

### Alpha

ID	Pass/Fail
1	Fail
2	Fail
3	Pass
4	(Not Runnable)
5	(Not Runnable)
6	(Not Runnable)
7	Pass
8	Pass
9	Pass
10	Pass
11	Pass
12	Pass
13	Pass
14	Pass

### Beta

ID	Pass/Fail
1	Pass
2	Fail
3	Pass
4	(Not Runnable)
5	(Not Runnable)
6	(Not Runnable)
7	Pass
8	Pass
9	Pass
10	Pass
11	Pass
12	Pass
13	Pass
14	Pass

# QA Report

## ► Test Run Comparisons Cont...

### Alpha

ID	Pass/Fail
13	Pass
14	Pass
15	Fail
16	Pass
17	Pass
18	(Not Yet Implemented)
19	(Not Yet Implemented)
20	(Not Yet Implemented)
21	Pass
22	(Not Yet Implemented)
23	Pass
24	(Not Yet Implemented)
25	Fail
26	Fail
27	Fail

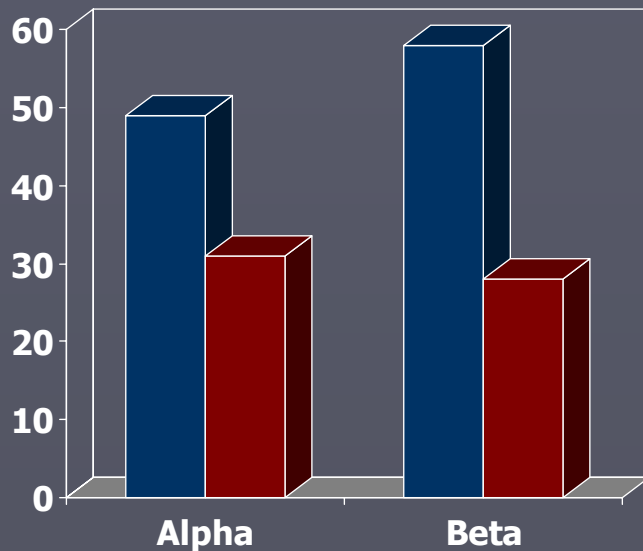
### Beta

ID	Pass/Fail
13	Pass
14	Pass
15	Pass
16	Pass
17	Pass
18	Pass
19	Pass
20	Pass
21	Pass
22	Pass
23	Pass
24	Pass
25	Fail
26	Fail
27	Pass

# QA Report

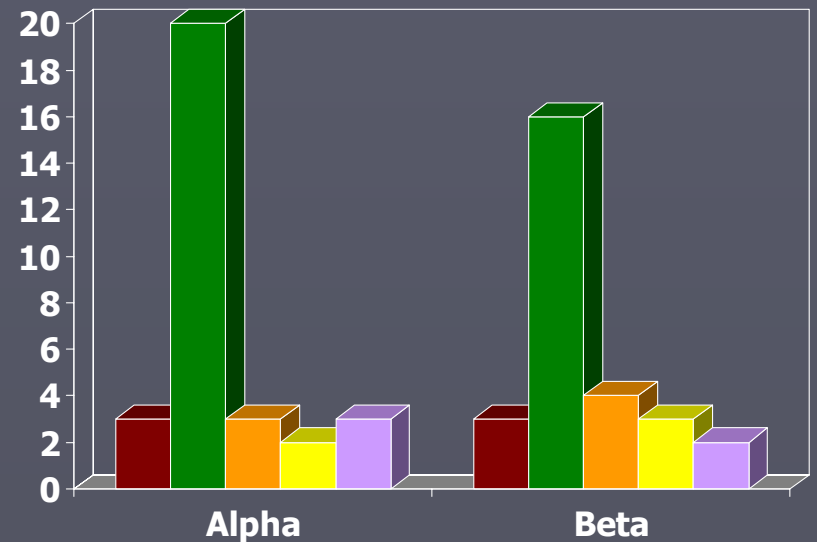
## ► Bug Status Comparison

Bugs Reported/Outstanding



■ Reported ■ Outstanding

Severity Breakdown of Outstanding Bugs



■ Major ■ Normal ■ Minor ■ Trivial ■ Enhancement


# QA Report

- ▶ Test Description: UUnit
  - Automated Unit Testing tool
  - Tests awardCredit function
- ▶ Sample Test Run
  - Test Name: awardCredit Unit Test
  - Test Description: Automated test of the awardCredit function, implemented using UUnit – runs 36 test cases
  - Build: v1122 (Beta is v1124)
  - Steps:
    - ▶ Run Checkmate as dedicated server with UUnit mutator enabled
    - ▶ Once match starts, check server log for failures

# QA Report

- ▶ Sample Test Run Cont...
  - Results:
    - ▶ 6 Test Cases reported failure

```
Antalus: DM-Antalus (0 players)
ScriptLog: Adjust skill False
ScriptLog: MinPlayers 0
ScriptLog: WeaponStay: True
ScriptLog: TeamGame::InitGame : bBalanceTeams True
Log: MasterServerUplink: DoUplink is False, not connecting to Epic master server
ScriptLog: Webserver is not enabled. Set bEnabled to True in Advanced Options.
Log: xUtil::CacheLoad CachePlayers (0.031014 seconds)
ScriptLog: Team AI is DM-Antalus.TeamAI
ScriptLog: Team AI is DM-Antalus.TeamAI
Log: 14 ANTIPORTALS
Init: Game engine initialized
Log: Startup time: 0.586435 seconds
ScriptLog: MATCH STARTING
ScriptLog: Test case 1.10 FAILED. Expected: 2, Actual: 1
ScriptLog: Test case 1.12 FAILED. Expected: 4, Actual: 3
ScriptLog: Test case 1.16 FAILED. Expected: 2, Actual: 1
ScriptLog: Test case 1.18 FAILED. Expected: 4, Actual: 3
ScriptLog: Test case 1.23 FAILED. Expected: 2, Actual: 1
ScriptLog: Test case 1.30 FAILED. Expected: 2, Actual: 1
ScriptLog: START MATCH
>
```



# QA Report

## ▶ Sample Test Run Cont...

### ■ Investigation:

- ▶ Test Cases run through all combinations of each player class fragging each other player class (36 Test Cases)
- ▶ Test Case Failure Analysis:

Case ID	Description	Expected	Actual
1.10	Knight (3) frags Rook (5)	2	1
1.12	Knight (3) frags King (10)	4	3
1.16	Bishop (3) frags Rook (5)	2	1
1.18	Bishop (3) frags King (10)	4	3
1.23	Rook (5) frags Queen (9)	2	1
1.30	Queen (9) frags King (10)	2	1

See a pattern?

# QA Report

## ▶ Sample Test Run Cont...

- Failure Breakdown:
  - ▶ All failures 1 less than expected result
  - ▶ All failures occur between classes that do not divide equally
- The culprit:

```
function int awardCredit(Controller killer, Controller victim) {
    local int killerValue, victimValue;
    local int credit;

    //get the weighted values of the participating players
    killerValue = class<CMPawn>(killer.PreviousPawnClass).default.CMValue;
    victimValue = class<CMPawn>(victim.PreviousPawnClass).default.CMValue;

    if (killerValue <= victimValue) {
        credit = ceil(victimValue / killerValue);
    } else {
        //no credit for killing a lower class
        credit = 0;
    }
    return credit;
}
```

"ceil (int/int)"  
instead of  
"ceil(float/float)"

- Resolution? Replace int type with float type!



# Deployment

## ▶ Current Method:

- Build package uploaded to website (formal installer)
- Customer notified of new version, along with feature list
- Builds deployed to customer:
  - ▶ Demo (March 21, 2003)
  - ▶ Alpha (Oct 1, 2003)
  - ▶ Beta (Oct 29, 2003)
- Requires most up-to-date version of UT2003

## ▶ Future Method:

- UnnaturalGaming.com website will be created for promotion
- Files will be hosted by Fileshack.com
- Automatically advertised on Epic's website when Checkmate is entered into the "Make Something Unreal" contest (February 2004)

# Deployment

## ► Issues:

- Filesize: ~10Mb from a personal server
- No formal webpage
- No formal manual
- Some manual work required to bind keys

# Project Plan

## ► Tasks Remaining

- In-game Help System
- In-game special ability key binding
- Reorganization of in-game messages
- Feature Enhancements (Balancing, Bug fixing)
- Deployment: documentation & website creation
- Final Report

## ► Future Updates (Outside the scope of this project)

- Knight's Special ability: EMP Shockwave
- Distribution of King's accumulated credits to rest of team
- Multimedia: New player models, weapon models, maps, interface graphics, etc



Questions / Comments