**Background, Data, and Business Requirements (BDBR)**

**Background**

Capack Galactic 2 Treasure Planet (CG2-TP) is the latest installment in the popular Capack Galactic (CG) casual puzzle game series of the SparkIT-Game Company. The original game (CG-1) was successful, and based on that success; the company is in need of rolling out a new cloud-based automation system. The system will need to handle expected loading during critical press events and monitor for continuing use of the cloud-based back-end system for the game. The core requirement is to keep game play smooth and available throughout a year of anticipated ups and downs of user demand due to marketing events, word-of-mouth advertising, and positive press across all platforms. See the following timeline:

* *November through April:* Beta and gold disk releases, including beginning back-end systems, will be put in place and stress tested before the game goes live.
* *Early April:* The game will go live in online app stores.
* *Late April – Gaming-Culture Festival in Boston (PAX East):* The game will be featured in both the brochure and interviews. The interviews are scheduled with major gaming magazines, bloggers, and influencers in the gaming community. Attendees who download the game on their devices will receive a code for a free in-game purchase of 100 gold coins.
* *August – Gaming-Culture Festival in Seattle (PAX West):* The game will be part of the world’s leading live media stream, with professional CG players in game mode on a Friday night (prime live streaming time). It will also be livestreamed from the game floor to both the gaming-culture festival and the live media stream websites, with recordings loaded to a video-sharing website for the gaming community. Our company is giving away CG2-TP prizes to all attendees of the live streaming video platform community live game play. Other marketing will be applied, including a free in-game purchase of 100 gold coins for attendees who download the game on their devices.
* *October – Gaming-Culture Festival in Melbourne (PAX AUS):* A small team will be in Melbourne, Australia, and the game will be featured in both the brochure and interviews. The interviews are scheduled with major gaming magazines, bloggers, and influencers in the gaming community in the Asia-Pacific region. Attendees who download the game on their devices will receive a code for a free in-game purchase of 100 gold coins.

Then the holiday season in Europe, North America, and sections of the Asia-Pacific region arrive, giving the game a much needed holiday sales boost during this time period. (See the projected data in Data Table 2.)

Current game play: As seen in Data Table 1 and the graph below, CG-1 was successful because the holiday season had a 10% retention rate from download to continued play 12 months later. The curve for CG-1 looks like these downloads over continuing players were achieved by only using word of mouth. We believe that given the publicity around the new game, we should see a substantial increase for version 2.0 of CG2-TP. Below are the full statistics of downloads and the continuing players over time for CG-1 as a reference for loading. Our initial design for CG-1 did not always function as planned, and game play was sometimes lagging at critical times. We wish to avoid these same problems with CG-2 based on our projections. (See Data Table 2.)

Data Table 1 (All Numbers in Thousands)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Downloads | Play 30 | Play 60 | Play 90 | Play 120 | Play 160 |
| March | 300 | 0 | 0 | 0 | 0 | 0 |
| April | 350 | 225 | 0 | 0 | 0 | 0 |
| May | 325 | 225 | 120 | 0 | 0 | 0 |
| June | 278 | 202 | 140 | 100 | 0 | 0 |
| July | 300 | 195 | 180 | 120 | 80 | 0 |
| August | 367 | 250 | 200 | 120 | 82 | 45 |
| September | 500 | 379 | 300 | 160 | 120 | 80 |
| October | 502 | 400 | 376 | 225 | 140 | 90 |
| November | 800 | 600 | 550 | 300 | 160 | 93 |
| December | 1,200 | 1,100 | 1,000 | 800 | 629 | 450 |
| January | 900 | 700 | 600 | 450 | 420 | 334 |
| February | 800 | 700 | 600 | 500 | 398 | 219 |
| March | 950 | 845 | 750 | 600 | 500 | 235 |

We have used heavy marketing for CG2-TP, including positive press as well as featured marketing using gaming-culture festivals and live media streaming platforms. Consequently, we believe CG2-TP will far surpass the sales of CG-1. In order for players to have a great impression of the game, it is critical that game play, including initial download, data saves, in-game purchases, and cooperative play, be flawless. Based on projections, we need to ensure that the scalability of the game back end be preset to address the effect that these marketing plans and the holiday season will have on the back end for CG2-TP. This is not including the possibility of the game being featured as a “game of the month” in any of the major app stores.

Projections for CG2-TP are as follows:

Data Table 2 (All Numbers in Thousands)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Downloads | Play 30 | Play 60 | Play 90 | Play 120 | Play 160 |
| April | 2,000 | 0 | 0 | 0 | 0 | 0 |
| May | 1,200 | 960 | 0 | 0 | 0 | 0 |
| June | 1,000 | 800 | 936 | 0 | 0 | 0 |
| July | 900 | 720 | 842 | 556 | 0 | 0 |
| August | 4,000 | 3,200 | 3,744 | 2,471 | 914 | 0 |
| September | 2,700 | 2,160 | 2,527 | 1,668 | 617 | 272 |
| October | 3,000 | 2,400 | 2,808 | 1,853 | 686 | 302 |
| November | 5,000 | 4,000 | 4,680 | 3,089 | 1,143 | 503 |
| December | 8,000 | 6,400 | 7,488 | 4,942 | 1,829 | 805 |
| January | 7,000 | 5,600 | 6,552 | 4,324 | 1,600 | 704 |
| February | 5,500 | 4,400 | 5,148 | 3,398 | 1,257 | 553 |
| March | 5,400 | 4,320 | 5,054 | 3,336 | 1,234 | 543 |
| April | 6,000 | 4,800 | 5,616 | 3,707 | 1,371 | 603 |

**Business Requirements**

* *Ability to scale to critical events based on projections and actual data and lessons learned from CG-1 and on the projections for CG-2.* (See the data tables above.)

The game application requires one core, one web front end, one web back end, one database, and one micropayment server for every 40,000 (estimated) users of the game. Downloads of the game and updates are managed separately through online app stores. This means there are five template images per cluster, serving 40,000 users. If the estimate of 40,00 users is NOT a good number for performance of the system, revise the number of users per systems cluster and revise the number of clusters needed for this process.

* *Ability to monitor the capability of systems and using elastic services.*

Back-end core systems should be provided based on actual demand plus a projected demand of 10%. There should be a 10% of core systems in ready status. For example, when the game reaches 30,000 users, a new core, web front end, web back end, and database images are brought up to active status. Load balancers should register the new systems ready for use if properly initialized.

Cooperative play servers are a separate group cluster that users can enter by accessing the subgroup “arena” within the game app. The cooperative play arena is a separate group of systems that randomly match players to test their puzzle-solving and game-strategy skills. This system also has an automated artificial intelligence (AI) package that will match with players if no suitable matches are available in the arena.

The following scripts must use preconfigured template images in protected stores:

* //cloud\_images/CGSP-2-core (for core services)
* CG2-web-front (for front-end web images)
* CG2-web-back (for back-end web services)
* //cloud\_images/CG-db (for data services)
* //cloud\_images/CG-2-Micropayment (for transaction services)
* //cloud\_images/CG-2-CoopPlayCore
* //cloud\_images/CG-2-CoopPlay-gw
* //cloud\_images/CoopPlay-env for the cooperative play module

The cooperative play setup is one core, one gateway/match/AI, and one environment. The setup can handle up to 20,000 players per cooperative play cluster. Under CG-1, 42,000 players at most were engaged in cooperative play at any given time. Autoscaling should monitor how many players are in cooperative play and turn cooperative play clusters on and off as needed. A minimum of one cluster should be available at all times, with a maximum of one cooperative play cluster for every six CG-2 clusters.

Autoscaling services should automatically roll back to reduce the number of servers, after the load balancer quenched those connections as they age off. For example, if a game cluster (e.g. core, web front end and web back end, database, and micropayment server) are to be taken offline, the load balancer will be notified to stop sending traffic to that cluster. Also, when connections = 0 (zero), the cluster will be taken offline.

Autoscaling services should perform correspondingly on the cooperative play cluster in line with the main game systems. For cooperative play, the balance of six games to one arena should always favor the higher number. For example, if there are eight game servers operating, there should be two arena clusters operating.

Micropayments via the micropayment server or the application programming interface (API) ties back to all online app stores for payment. Players will log in to these services using their online app store account and commit the transaction there. The transaction confirmation will be sent via a queue to the game and then the requested in-game purchase will be approved and authorized. If the payment comes back as declined, customers must be given an error notice. This transaction confirm/no confirm should be written to //data-currency-CG-2-pAPI/.

Diagnostic data from the game cluster should be written to //data-automation-diagnostic-CG-2-game/ for all actions taken by the automation, including error conditions.

Diagnostic data from the arena cluster should be written to //data-automation-diagnostic-CG-2-arena/ for all actions taken by the automation, including error conditions.

Each new cluster activated or deactivated should send a message via a queuing service to the help desk ticketing system via [helpdesk@SparkIT\_game.com](mailto:helpdesk@SparkIT_game.com) when activated, deactivated, or in error condition. If a cluster is in error state, steps should be taken to remove the cluster from service and follow the procedure for removing a cluster from the cluster queue in the load balancer.