

## Information Operations in and around EVE Online

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### Abstract

*Massively Multiplayer Online Role Playing Games (MMOs) provide a persistent virtual world for players to explore and interact with. CCP's EVE Online is a science fiction MMO that explicitly encourages conflict between players. Information operation strategies are employed by groups of EVE Online players inside and outside the virtual world to seek tactical and strategic advantage. Players use propaganda, deception, and computer hacking techniques to complement their virtual military and economic operations. This paper examines how information operations are being conducted in and around EVE Online and the effect MMO information operations can have on the greater information environment.*

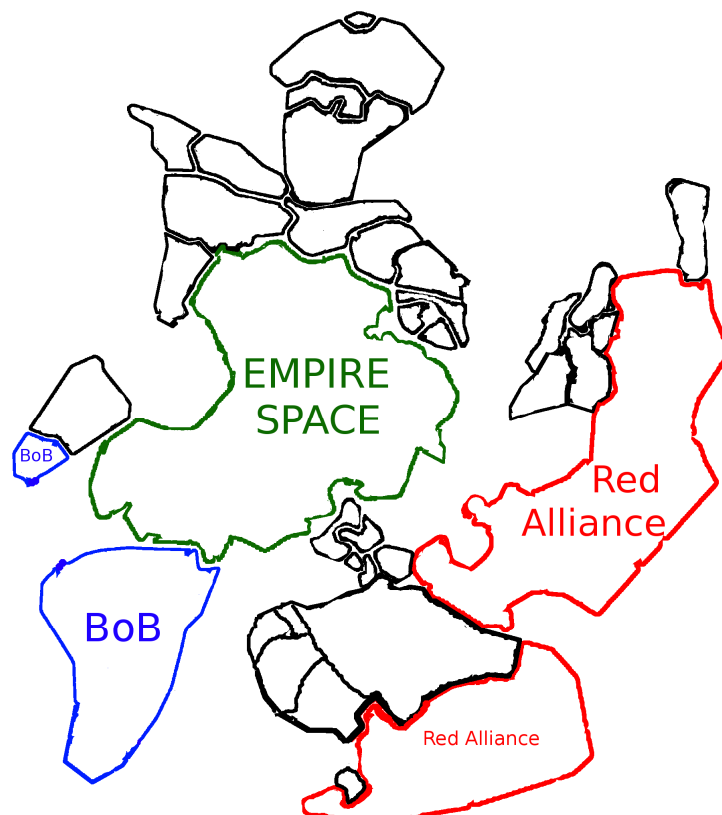
**Keywords:** Massively Multiplayer Online Games, MMOs, Games, Information Warfare, Information Operations, Deception, Propaganda

### Background

CCP's EVE Online (EVE) is a Massively Multiplayer Online game (MMO). MMOs are virtual recreational environments in which large number of users interact with the aim of recreation, socialising, and achieving goals set by the game, other players, or themselves. EVE Online is an open ended MMO, an unstructured virtual world set in a science fiction space opera universe where players are pilots of space vessels working for interplanetary corporations. EVE is comprised of over 5,000 solar systems each potentially containing several planets, space stations or moons (EyjoG, 2007). EVE has a population of 236,000 active accounts with a total of approximately 500,000 characters as of early 2008 (EyjoG, 2008). Unlike many other MMOs EVE Online's population all inhabit the same instance of the virtual world; this makes EVE Online one of the world's largest single virtual environments.

The currency of EVE Online is the Interstellar Kredit (ISK) which as of early 2008 had a real world secondary market value of between US\$0.07 and US\$0.08 per million ISK (1 million ISK is a standard denomination) (IGXE, 2008) (MMOGCart, 2008). The Gross User Product (analogous to a country's Gross Domestic Product) was 51 Trillion ISK (over 4 million USD) in the month of June 2007 giving an annual product of approximately 50 million US dollars or US\$227.27 per user (EyjoG, 2008). These figures show an economy larger than that of several real world nations (CIA, 2008). The Gross User Product per user account figure is particularly interesting as it exceeds the cost of an annual subscription to the game — US\$131.40 subscription versus US\$227.27 GUP/user (CCP, 2008) — meaning that an average user will generate more wealth than the cost of the game subscription.

The 5,000 solar systems of EVE Online are divided into three categories by how active non-player (computer controlled) law enforcement is. High security space is the area ruled by non-player government elements (collectively called "Empire Space") and any unlawful act of aggression is punished with lethal retribution. High security space is located in the centre of EVE's galaxy and is primarily the home to new players or players recovering from financial ruin. Low security space is the area surrounding high security space and is monitored but not patrolled by non-player law enforcement. Here infractions result in a loss of reputation with the non-player government which can result in restrictions on the ability to visit high security spaces. Lawless space — also called 0.0 space in reference to its security score — is territory where crimes are ignored by non-player authorities and the only civilisation that exists is that established by players. Low security space is connected to lawless space through a small number of choke points that lead out to the lawless galactic arms. (CCP, 2008). The most valuable mineral resources are located in lawless space encouraging player alliances to colonize and exploit those regions.



**Figure 1:** Political Map of EVE Online galaxy showing Empire space and two of the larger alliances.

Players self-organise into player run corporations which provide a mutual support and social network, similar to guilds in other MMOs. Corporations cooperate and form alliances with each other. These alliances usually take the form of a shared foreign policy stance, a military cooperation treaty and a freedom of movement and trade agreement. As of 2008 the ten largest alliances have between 1,655 players and 5,238 players with the largest alliances being the GoonSwarm Red Alliance with 57 member corporations and 5,238 players, Knights of the Southerncross (Disbanded as of February 2008) with 80 member corporations and 4,018 players, and Band of Brothers with 13 corporations and 2,737 players (CCP, 2008). These alliances are often supported by external communication channels such as voice over

IP services (for example TeamSpeak), instant messaging, private web pages and private forum pages as well as through internal chat channels supplied by the game client.

Warfare in EVE Online is unlike that of other MMOs as there is little player micromanagement of combat performance — once a skirmish has been engaged the player's options are limited. Multi-player fleet battles strongly favour operational level planning and intelligence as the order of battle and the quality of the fleet commander are a more decisive factor than player reflexes.

War in EVE Online is conducted for territory control and involves fleet manoeuvres and skirmishes culminating in a siege of an installation, these sieges can last many hours. Following a successful siege days of consolidation are required to fully assimilate new territory. The participants in these battles can range from as few as 3 or 4 ships in small skirmishes up to fleet engagements involving 2,000 ships — for practical purposes 500 participants is the maximum before network latency and server strain imposes limitations (Wijinen, 2007).

### **Information Operations inside EVE Online**

In support of their combat operations alliances engage in a variety of Information Operations inside the virtual world. EVE corporations engage in deception campaigns, economic sabotage, infiltration and human intelligence collection. Some alliances (notably GoonSwarm) run dedicated information operation, intelligence and special operation teams. GoonSwarm created the GoonSwarm Intelligence Agency (GIA) to manage human intelligence collection and special 'black' operations (Breckon, 2007).

Through late 2006 and early 2007 the GoonSwarm and Lotka Volterra alliances were engaged in a vicious struggle. The conflict was largely decided by the battle for information superiority as the two corporations were well matched economically and militarily. GoonSwarm managed to infiltrate Lotka Volterra in multiple instances as well as recruit several Lotka Volterra players as agents. Lotka Volterra however had a significant amount of operational security and counterintelligence, managing early in the conflict to conceal the construction of a super-weapon — a Titan class ship — which when deployed managed to cripple an entire GoonSwarm fleet of over 200 ships. However, after this incident the GoonSwarm Intelligence Agency quickly realigned its intelligence priorities and engaged in further infiltration plans. By February 2007 an agent of the GoonSwarm Intelligence Agency had located the Titan construction facilities and a new Titan nearing completion and managed to stage a surprise raid on the facilities striking a decisive blow against Lotka Volterra. The success of this operation severely damaged the morale of Lotka Volterra as the destroyed Titan represented weeks of efforts and billions of ISK invested. GoonSwarm agents inside Lotka Volterra shortly afterwards managed to spread fear, uncertainty and doubt among the Lotka Volterra players to the point where member corporations started defecting and the alliance became defunct (Breckon, 2007). This conflict demonstrates GoonSwarm's advanced information warfare capabilities as they were able to successfully orchestrate strategic military intelligence operations while simultaneously running a successful psychological operations campaign.

Another example of this can be seen in the covert action involving the Guiding Hand Social Club (GHSC) that occurred a year earlier. GHSC is a mercenary corporation specialising in virtual assassination that offers its military services to the highest bidder. GHSC had been hired to assassinate the leader of the Ubiqua Seraph Corporation for 1 billion ISK (then

approximately US\$300). Due to the scale of EVE Online it was unlikely that GHSC could ever track down their target in open space and instead set upon a yearlong campaign of infiltration. GHSC employed several deceptive techniques to help their agents improve their reputation with the target including staged mock battles where the agents would gain reputation with their target by killing their target's enemies. After several months GHSC had multiple agents deep inside Ubiqua Seraph including one who had become Ubiqua Seraph's second in command. Using this trusted access GHSC convinced the leader of Ubiqua Seraph to fly into a trap, easily dispatching her while at the same time triggering all the GHSC agents to execute a large theft. The Ubiqua Seraph Corporation was devastated by their leader's humiliation and the loss of a majority of its assets and liquid ISK, and shortly after the corporation disintegrated. The Guiding Hand Social Club gained assets worth approximately US\$16,500 (over 30 Billion ISK), which is the largest virtual world theft on record (Francis, 2005). Besides the size of the operation this event is significant as it demonstrates that EVE Online has spawned organisations with the capability to conduct covert operations that utilise information operations not only on their own behalf but also as a service.

Information operation techniques are also used against enemy economies via market manipulation. A common type of market manipulation in EVE relies on enemy players buying components from trusted marketplaces without checking the price. To exploit this the market manipulator enters enemy or neutral territory to locate a trusted market. Once there the manipulator purchases the staple items of the market place and then relists them at a significantly inflated price. Ideally the manipulator exhausts the market of legitimate sell orders but this is not always possible in larger market places. When the enemy players come to do business with their trusted outpost they will often purchase the goods without a thorough examination of the price allowing the manipulator to effectively steal the difference in price from them (Shikari, 2007). The economies of opponent alliances can also be manipulated through less subtle methods such as attacks on industrial and mining operations that will limit the supply of raw materials and finished products reaching their markets.

### **Information Operations around EVE Online**

In addition to the information operations occurring inside the virtual world EVE Online alliances use information operations outside the game to support their game positions. Players and alliances have utilised propaganda techniques, social engineering, phishing and outright hacking to support their in-game activities. These operations have led to the development of sophisticated counterintelligence regiments designed to assure the integrity of the alliances' communications.

EVE Online has been the target of several phishing scams targeting player's login details (Hunter, 2005). These phishing attacks aim to steal the virtual currency and items of the victim which can then be traded on the secondary market for real currency. While there is no direct evidence that these attacks were instigated as a part of an in-game covert action, this technique could certainly be used as part of inter-alliance warfare in an attempt to steal assets from the compromised account's corporation or in an attempt to access classified intelligence or plant false messages.

Alliances commonly communicate plans, news and notices to their members through their forums. This makes an alliance's forums a prime target for exploitation. During infiltration and human intelligence operations forum access is a primary intelligence target. As well as utilising techniques such as infiltration and recruitment players also employ social engineering attacks to try and convince players to give up their forum credentials. A small

number of players have even used software vulnerabilities in the forum applications to hack into the systems to gain access to confidential communications. One such player, Kugutsumen, is paid to infiltrate alliances' forums. In early 2007 he infiltrated the forums of the Band of Brothers alliance (Blancato, 2007) and discovered signs of collusion between Band of Brother's leadership and CCP game developers. In this case the developer granted billions of ISK worth of advanced ship schematics to the Band of Brothers. Kugutsumen publicly released the information on EVE Online's official forums only to have his posts deleted, his account banned and the allegations denied by CCP. Later, after much public outcry, the developer in question admitted to wrong doing (t20, 2007). This led to CCP instituting an internal affairs department to monitor their staff's interactions with the virtual world (Arkanon, 2007).

There have also been instances (Erillion, 2007) of unauthorised players accessing an alliance's TeamSpeak voice chat server either having obtained the password through infiltration or social engineering or through a vulnerability in the server. This access is very valuable as most alliances use their TeamSpeak server as their primary tactical communications channel, issuing all orders and receiving all status reports over the high bandwidth voice channel. This kind of unauthorised access can therefore be exploited to gain tactical insights during engagements. Alternatively, the access is used as a deception or denial of service tool where the fleet commander is impersonated and false orders are given or where a constant noise is introduced to the system as a denial of service attack. Countermeasures to these attacks can easily be implemented once the attacks are detected but in the initial moments of confusion enough damage may be done to significantly influence the outcome of an engagement.

Because alliances consist of loose coalitions of players that do not necessarily have any ideological or nationalistic ties they are also particularly vulnerable to propaganda based attacks. The lack of a central purpose or binding ideology makes propaganda campaigns a particularly effective tool for major alliances. Alliances use propaganda internally to ensure cohesion by keeping morale high and reinforcing a sense of purpose as well as offensively to break the morale of their enemies and to sway the opinion of neutral parties (Combs, 2007).

Some corporations however, are less vulnerable to propaganda as they have external sources of cohesion; GoonSwarm and Red Alliance for example have additional structures to reinforce player morale. GoonSwarm is bound by its basis in the existing community of the SomethingAwful.com forums. Red Alliance is a Russian-centric corporation with Russian nationals or expats forming the majority of its players. Even with these structures the GoonSwarm / Red Alliance coalition is still vulnerable to propaganda as only the core groups within this alliance have any special solidarity, and a large number of corporations in the alliance have no affinity to the ideals of the alliance.

The propaganda techniques of the alliances are advanced and deliberate. GoonSwarm in particular has borrowed from historical sources such as Goebbels' principles of propaganda (Doob, 1948) and Cold War era Soviet propaganda when producing propaganda videos (Endie, 2007). During the conflict between GoonSwarm and Band of Brothers both sides conducted propaganda campaigns to discredit their enemies. Band of Brothers produced a video shortly after losing territory in an attempt to portray themselves as the victims and win support from neutral factions (BoB, 2007). GoonSwarm retaliated shortly thereafter with a video reminding viewers that Band of Brothers were the aggressors in the conflict and stating that GoonSwarm would not be stopped (GoonSwarm, 2007). GoonSwarm propaganda

concentrated on intimidation preferring to disrupt the morale of their enemies. One example of this occurred later in the conflict when GoonSwarm sent a notice out to Band of Brothers trying to create a schism by claiming that their alliance was fracturing and that their defeat was imminent (Goonswarm, 2007).

As a result of the growing sophistications in information operations within the game EVE Online alliances have started implementing information assurance programs to protect themselves from espionage and deception campaigns. Information security procedures — including the compartmentalisation of information, keeping to the need to know principle — are being enforced. Personnel security is also being enforced with background checks, vetting and probation periods for new recruits without solid references (Breckon, 2007). Communication security and contingency planning is also important with corporations taking steps to secure their forums, change the authentication codes to their TeamSpeak servers and have backup channels ready in case of disruption (Blancato, 2007).

### **CCP, Player Motivations and the Effect on the Environment**

CCP have deliberately refrained from interfering with the information operations of its players stating that problems that can be resolved through in-game warfare do not require the intervention of the administrators. CCP thereby implicitly condoned the actions of the Guiding Hand Social Club and GoonSwarm in conducting operations that have resulted in the destruction or theft of billions of ISK (Breckon, 2007) (Francis, 2005). CCP only intervene when their terms of service (CCP, 2008) are breached, in which case the offending account is banned (Blancato, 2007). CCP believes in the ability of players to resolve their own disputes and contends that any activities executed inside the framework of the game are permissible.

Games like EVE Online are creating a healthy population of players skilled in conducting information operations. These populations are used to acting within structures vaguely militaristic and are skilled in using these techniques to the detriment of their opponents. As games like EVE Online continue to grow in popularity — according to EyjoG (2007), EVE is growing at a rate of 14% a quarter — the online gaming subculture is becoming a culture savvy in the practice of information warfare. This new culture of information warriors is a valuable source of talent to the commercial sector, governments, militaries and issue motivated groups in the pursuit of information superiority (Stockwell & Muir, 2003).

### **Conclusion**

EVE Online is a virtual world where conflict is encouraged and player organisations are sovereign states. Virtual goods in EVE Online are worth significant amounts of money when traded on the secondary market and conflicts for the resources required for the construction of these items are fierce and constant. In seeking advantage in these conflicts players have developed sophisticated information operation capabilities — players conduct espionage operations, create and distribute propaganda, as well as in some instances use hacking and phishing techniques to gain intelligence. As a result of these aggressive strategies player organisations have started looking to information assurance programs and complicated counterintelligence strategies to protect themselves. The growing emergence of an internet subculture that is proficient in the ways of information warfare is significant as it can be harnessed to create information operations capabilities for organisations outside of the game.

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