

The object of study of Alexander Galloway's book *Protocol* is the *apparatus of control* specific to the control society of the end of the twentieth century and the beginning of the twenty first. He describes it as comprising of a *diagram* (the distributed network), a *technology* (the digital computer), and a *management style* (the protocol).

During three conventionally agreed upon historical periods, power has distinct forms of organization. Foucault defines the first two: the sovereign society of the classical era, characterized by centralized power, and the disciplinary society of the modern era, characterized by decentralized power¹. Deleuze continues Foucault's periodization and defines today's society as control society, characterized by distributed power². Galloway's book elaborates on specific characteristics of this third phase, "by focusing on the controlling computer technologies native to it."³. The shift towards the third phase, according to Galloway, is marked by the computerization of the information management system, which is encapsulated in the largest computerized information system, the *Internet*.

In the first part of the book Galloway examines *protocol* in its positive representation, as a physical, formal and political technology. As a *formal structure*, computer protocols, according to Galloway, are technological languages, codes which regulate the flow of information through the distributed network of the Internet. The Internet originates in a military project of the late '50s, and was built to withstand nuclear attacks, since it functions on packet-switching technology and has no central command centres, resulting in a highly flexible and adaptable distributed network.

Based on Baran's classification⁴, Galloway presents three types of network diagrams. The simplest is the *centralized network*, a hierarchical network which operates with one authoritative hub and many radial nodes. Communication is one-way and restricted to hub-node pairs. One example of such network is the panopticon. The second type, *decentralized networks*, is the most common diagram of the modern era, which comprises of many hubs, each having its own area of dependent nodes, without any central point of control. *Distributed networks* have no central hubs and no radial nodes, rather each entity is equal to any other and acts autonomously, having Deleuze and Guattari's rhizome⁵ as perfect example. This type of network is not only specific to the digital world, but is also part of a shift in social life, which started with the crash of the bureaucratic systems.

The *Internet* takes the shape and structure of a distributed network of autonomous agents, who act according to an agreed set of technical rules, comprised in protocols. The distribution of responsibilities on layers within the Internet as follows below, is the condition of existence of the distributed network. According to one of the protocological documents, *Requirement for Internet hosts*, the Internet is a network of networks. According to the same document, the protocol has four basic layers. The *application layer* is the semantic layer, which ensures that the content of data is preserved during network transactions. The *transport layer* makes sure that the data travelling through the network reaches its destination correctly, having the capability to correct errors if loss of data occurs during transport. The *Internet layer* is responsible for the routing, directing of data to its destination through the network. The *link or media-access layer* is concerned with technology specific issues which enable data transfer. The four layers are encapsulated on in the other, starting with the application layer and ending with the largest, the link layer, which encapsulates all of the other layers. Galloway acknowledges that there are different models of protocol layers, and that the four layer model can be further expanded into the seven-layer model of ISO, the OSI (Open Systems

¹ Foucault, Michel, *Discipline & Punish: The Birth of the Prison*, Vintage Books, New York, 1995, p. 195-228

² Deleuze, Gilles, *Postscript on the Societies of Control*, in *L'autre journal*, No. 1, May 1990, p. 3-7

³ Galloway, Alexander, *Protocol: How Control Exists After Decentralization*, MIT Press, 2004, p. 3

⁴ Baran, Paul, *On Distributed Communications*, Santa Monica, CA:RAND, p. 2, in Galloway, *Protocol*, p. 30

⁵ Deleuze, Gilles, Félix, Guattari, *A Thousand Plateaus*, University of Minnesota Press, Minneapolis, 1987, in Galloway, *Protocol*, p. 33

Interconnection) Reference Model, but that protocol can be also reduced to a two layer model, such as the one described by Lev Manovich⁶.

Galloway further analyzes two of the most relevant protocols of Internet, TCP/IP and DNS. The *TCP/IP* protocol suite consists of two peer-to-peer protocols, TCP and IP. TCP, as part of the transport layer, is responsible for correct transport and delivery of data through the network, while IP is responsible for the routing of data through the network and its fragmentation into small packets, process which renders the data the necessary flexibility to travel through a wide range of networks with different limits for packet size. While the TCP/IP protocol is concerned with host-to-host communication and composes a horizontal system of distribution of control into autonomous host computers, the *DNS* protocol is responsible for translating Internet addresses from names into numbers, called IP addresses, in a process called resolution. The introduction of the DNS in 1984 marked the decentralization of the resolution process. While previously contained in one document on an unique name server, the DNS introduced a decentralized database, which operates as an inverted tree. A domain name consists of a top-level domain (.org, .edu, .com, etc.) and one or more sub-domains. The resolution of the domain names is done by several root servers hierarchically and decentralized.

Protocol's dual nature, and, at the same time, what makes it functional, resides in the tension between these two technologies: "One radically distributes control into autonomous locales [...], and the other focuses control into rigidly defined hierarchies"⁷ Other characteristics of protocol derive from the analysis of this dual nature. Due to the DNS, protocol is an *universalizing system*, a language which constructs an exhaustive index of items through one-to-one relationships. It's purpose is totality. From analyzing the TCP/IP protocol, it results that protocol is materially immanent to a set of data, being contained in the data header.

From a *critical theory* approach, Galloway concludes the structural analysis of the physical technology of protocol with the observation that protocol resists interpretation, because it is a *delivery system*, and thus does not operate changes in the meaning of the transported data, but only codes, "wraps" it differently to allow transport.

After having analyzed the formal structure of protocol, Galloway addresses protocol as an *apparatus of signification*, taking into account the *formal qualities* of protocol, which have an impact at social level, where protocol functions as a set of norms of conduct, being thus placed in relation to control in the argument of Galloway's book: "protocol is how technological control exists after decentralization"⁸. If the first chapter treated protocol in terms of code from the point of view of the system administrator, the second chapter treats protocol as a set of norms of conduct, from the point of view of the webmaster.

From a neo-marxist approach, Galloway introduces several theoretical contributions, which prefigure the formal qualities of the Internet. The first mentioned is the formal Marxist theory of the media, drawing from Bertolt Brecht's theory of the radio. Its author, Hans Magnus Enzensberger believes that media, liberated from the political oppression and turned into many-to-many media, can have emancipatory characteristics. Enzensberger's description of the emancipatory use of media is the closest to the postmodern media, the Internet. Galloway mentions another two contributions, Robert Wiener's dynamic systems and cybernetics theory, and Vannevar Bush's Memex, qualities of which are similar to the network theory and act as precursors of it.

Galloway proceeds to a critical theory of the media, in order to unmask some common misconceptions related to the Internet. Although the Internet is commonly described as

⁶ Manovich, Lev, *The Language of New Media*, MIT Press, 2001, in Galloway, *Protocol*, p. 40

⁷ Galloway, *Protocol*, p. 50

⁸ *Ibid.*, p. 8

rhizomatic, it in fact reflects only some of the characteristics of the rhizome, such as the fact that it allows any node in the network to be connected to any other node. But, while the rhizome is non-hierarchical, some parts of the Internet are. And, while the Internet is described as a free, structureless network, the rhizome has a horizontal network.

The approach of the aesthetics of the Internet experience has a visible influence from film theory. Determinant to conceiving the Internet as an aesthetic, cultural object, is the quality of *continuity*, the capacity of creating a fluid and intuitive experience for the user, regulated by the IP protocol. Galloway describes a set of techniques which render continuity: “conceal the source”, “eliminate dead links”, “eliminate no links”, “green means go”, “true identity”, “remove barriers”, “continuity between media types”, “prohibition against low resolution”, “highest speed possible”, “prohibition on crashes”, “prohibition on dead media”, “eliminate mediation”, “feedback loops”, “anonymous but descriptive”⁹.

The argument continues with a genealogical analysis of the network elements generated by the software component, which function as conditions of existence for protocol. Galloway defines a *record* as any type of non-random information stored in a physical object, while the *object* is a positive unit of content or content description. Protocol is more than a type of object, it is a “universal description language for objects”¹⁰. Protocol thus governs objects, as a result of a negotiation of certain flows over the others, therefore giving a hegemonic nature to the network. The *browser* is part of the protocological machine and acts as an interpreting apparatus of HTML, whose purpose is to hide diversity and display totality, to accept everything. *HTML* is the protocol of graphic design, which functions by encoding layout instructions by means of tags within a text file. *Fonts* are also protocols. Fonts must not be seen as signifiers, because they are just a set of instruction which give shape, they are the principle of representation of a text in the digital world. All the described protocols contribute to rendering the formal qualities of the network and defining it as an *aesthetic, cultural object*.

After having approached the physical technology of protocol, and its formal qualities, Galloway analyzes the political nature of protocol and its influence over *life*: “protocol is an affective, aesthetic force that has control over ‘life itself’”¹¹. In order to build this argument, Galloway proceeds to a redefinition of life. He argues that life, through the action of protocological forces such as biopower, has become matter, at the same time as matter has become life in the control society, giving birth to non-human and hybrid autonomous life forms, such as cyborgs and artificial life systems. Thus redefined, all of these life forms fall under the regulation of protocol without discrimination.

Galloway employs as a starting point concepts of both Foucault and Deleuze. He defines protocol in relation to life forms using Foucault’s concept of biopolitics, defined as “statistical knowledge about populations”¹². The statistical approach on life results in knowledge which can be employed as form of control. Protocol becomes thus a *management system* of life forms, when life starts to be referred to through statistical coding.

Deleuze takes Foucault’s analysis further and at the same time outdates Foucault, as being a theorizer of the modern age. Deleuze introduces a particular quality of control societies of interest to Galloway: the existence of nonorganic life. According to Deleuze, in control societies “individuals become ‘dividuals’, and masses become samples, data, markets or banks.”¹³

⁹ Ibid., p. 65-69

¹⁰ Ibid., p. 74

¹¹ Ibid., p. 81

¹² Ibid., p. 85

¹³ Deleuze, *Postscript on the Societies of Control*, in Galloway, *Protocol*, p. 86

Galloway goes further into the prehistory of the protocological management of life, by analyzing the socio-political transformations which prefigure the emergence of protocol, as presented by Karl Marx in *Capital*. Marx's theories of reification (life becoming matter), and commodity fetishism (matter becoming life), prefigure the emergence of protocol. The concept of *second nature*, which refers to the tendency of material objects in modernity to be aestheticized thus becoming living entities, is a precondition of protocol, according to Galloway.

The analysis of Marx's *Capital* is introduced to prove that "life forms, both artificial and organic, exist in any space where material forces are actively aestheticized, resulting in a type of sculpted materiality, a materiality in which vital agents are managed, organized, affected, and otherwise made aesthetically active"¹⁴. Expressed differently, the force which regulates data flows regulates matter itself. And if matter can become life through aestheticization, understood as naturalization, just as Marx's analysis has turned capital into life, then protocol is a regulating force of life itself.

Galloway further broadens the discussion of matter taking a vital form, to introduce various types of artificial life, from early computers being considered in terms of the human brain, to life being treated as matter in genetic science. In this context he defines protocol as "a theory of the confluence of life and matter"¹⁵, and expresses the ambition of protocol to rule over both organic and nonorganic life. He employs Wiener's cybernetic theory to demonstrate that human and machines are alike, in that they both resist entropy and are therefore characterized by vitality, seen as an anti-entropic quality. The human-machine cybernetic system thus created as a communication or information organism falls under the regulation of protocol. The emergence of artificial life as prefigured by Wiener's cybernetic systems, is associated to the shift from linear programming to object oriented programming.

An important step in life falling under the regulation of protocol according to Galloway is the year 1953, when Watson and Crick discovered DNA. The discovery of the double helix operates an aestheticization of life. The DNA turns life into code, matter. The moment when life starts to be addressed as code is the moment when life becomes a medium for protocol. This is the historical moment when protocol becomes a controlling force in social life. To meet this new definition of life as matter, a new science has emerged, biometrics, which measures physical characteristics, such as fingerprints, retinal patterns, or blood tissue to determine the identity of individuals. This process of coding and reading human characteristics turns life into an aesthetic object, into a medium for the controlling force of protocol.

Galloway concludes the analysis of protocol as a political technology with collaborative filtering as an extreme example of the protocological organization of humans. Collaborative or suggestive filtering allows prediction of human characteristics, preferences in particular in web 2.0 applications, based on survey data. Identity is thus constructed based on predominant patterns, resulting in an overall homogeneity between individuals. This type of logic which protocol imposes on humans can be correlated with the technical protocol's aim towards totality, inclusion of everything by erasing local differences and heterogeneity.

After having analyzed the positive representation of protocol, Galloway analyzes the *bureaucratic and institutional context* in which protocol has emerged, as well as the threats and *failures of protocol* inherent to its institutional framework, and coming from other sources. What Galloway refers to as failure of protocol is the failure to fully expand as a management diagram. Galloway mentions several reasons for it. Proprietary and commercial interests are a threat to the expansion and well functioning of protocol. He points to spam, the use of the Internet networks to promote commercial interests, as

¹⁴ Galloway, *Protocol*, p. 110

¹⁵ *Ibid.*, p. 103

being a threat to protocol, as well as to the market monopoly of proprietary technologies, as in the Microsoft case. He adds bureaucratic, regulatory interests as being tactical failures of protocol, which nevertheless allow it to succeed strategically. Although these external forces: commercial, institutional, bureaucratic are connected to protocol and sometimes mistaken for it, they function as the inverse of protocol's control logic and act as its enemies. According to Galloway, the authority of protocol lays outside them, in the technology itself and the mode of programming.

Internet protocols and standards are established by a technocratic group of highly educated, altruistic professionals. Technologies in general experience standardization and mass adoption. Technologies of the '80s, such as the UNIX operating system and the C and C++ programming languages, have become largely adopted and standardized due to their openness, accessibility of code and low price.

Galloway continues to present examples of technologies which have experienced standardization over the years. He argues that the creation of standards is the recognition of technologies which proved successful on the market. He offers the example of VHS versus Betamax to support his point, and places the success of VHS in becoming standard on its pseudo-openness by means of licensing, as opposed to Sony's proprietary behaviour. This example does not fully integrate in the argument about Internet protocols, because licensing is a proprietary behaviour as well, as opposed to Internet protocol which becomes standard not based on market success, but based on processes of openness, free exchange and debate.

Today there are several institutions which facilitate standardization. IEEE is the largest and most important protocological institution in the world, which establishes standards in the areas of digital communication and wireless telephony. Other two important US active protocological institutions are NIST (National Institute for Standardization and Technology), and ANSI, which articulate consensus driven, open, transparent and flexible standards, subject to voluntary adoption.

Several other important standard bodies mentioned by Galloway are: the International Telecommunication Union (ITU), which focuses on radio and telecommunication, the International Electrotechnical Commission (IEC), which focuses on electrical technologies, and the International Organization for Standardization (ISO), whose goal is to establish vendor neutral technical standards by means of consensus. An important ISO standard related to the Internet is the OSI Reference Model, which classifies networking activity into seven layers. All these technical standard bodies are highly bureaucratic organizations, unlike the communities in charge with Internet standardization.

Four groups are in charge of Internet standardization: the Internet Society, an umbrella organization for other three: the Internet Architecture Board, the Internet Engineering Steering Group, and the Internet Engineering Task Force. The Internet protocol initiatives begin in the IETF, an open, informal, less bureaucratic community which produces the primary source materials for protocological documentation of the Internet, the *RFCs* (*Requests for Comments*). Some of these documents have the potential to become voluntary standards, based on gradual deliberation and negotiation. The process starts with the proposal of an Internet Draft, which, if survives revisions, is nominated for the standard track. The standard track follows a couple of steps before becoming a standard: proposed standard, draft standard and finally standard. Not all RFCs are STDs (standards), and not all standards have the same level of importance. Some of the most important are the ones which contain the documentation of the TCP/IP protocol. Other important protocols mentioned by Galloway are the ones that lead to the creation of the World Wide Web, such as HTTP and HTML, whose author is Tim Berners-Lee. This protocol suite is created and maintained by a different organization, the World Wide Web Consortium (W3C).

The paradox of Internet protocols is that they help engender a distributed system of organization, while being themselves supported by bureaucratic institutions (ICANN) or technologies (DNS). The analysis of Internet protocols leads to the conclusion of technical control as being the founding principle of Internet, even if a paradoxical one, which aims for openness, inclusion, universalism and flexibility, turning the Internet into the most highly controlled mass media known so far, according to Galloway.

By introducing the analysis of the institutional framework of protocol, Galloway extends the dual, paradoxical, contradictory, dialectical nature of protocol from the technical level, visible in the two opposing machines within protocol, TCP/IP and DNS, to a general principle, perhaps a philosophy of protocol: "in order to be politically progressive, protocol must be partially reactionary"¹⁶. The described institutional frameworks of protocol use standardization as a reactionary tactic, in order to enable protocol to reach its strategical goal of openness.

Further Galloway directs his analysis towards the future of protocol and its changing nature, by focusing on three types of users and their disruptive practices, which enable change within its frame. He addresses the resistive efforts to protocol within computer culture and how these model it. Galloway notes that the very nature of resistance has changed within the protocological age. The enormous success of the technology and its project of totality turn it into a natural force similar to gravity, according to Galloway, and make rejection or opposition as form of resistance worthless. The age of protocol thus requires new political tactics of resistance, drawn from within the protocol. The new form of resistance appropriates the behaviour of its adversaries, so that power and resistance to power become indistinguishable, causing *hypertrophy* as a tactical response to protocol.

Having redefined the concept and effects of resistance in the age of protocol, Galloway continues to use this technique of redefinition of concepts in order to appropriate them to the discourse of protocol, to introduce the series of disruptive actors and practices which contribute to the improvement and maturation of protocol.

The first approached is the *hacker subculture*. Galloway introduces an overview of the different significances attributed to the concept of hacker in its short history. From being idealized as explorers, visionaries of technology, as in the case of the original hackers at MIT, in the mid to late eighties the hackers' identity changed into outlaws and terrorists, through government legislation, and has gotten to be generally accepted today.

Galloway redefines hackers as *protocological actors* by means of an argumentation shift, rendering as outdated and unproductive their definition through the discourse of ethics, because it deals with concepts belonging to modernism. He re-theorizes hacking in relation to protocol by emphasizing their similarities: they both have unlimited and total access to computers, and they both seek to eliminate authority. Galloway's romanticized view on hacking is visible in the analogy of hackers' organizational forms with tiger teams, electronic adhocracies spontaneously created to meet a specific problem, a form of organization specific to late capitalism. This nomadic form of organization of resistance is also specific to the age of protocol, when they act as a temporary network of autonomous agents, getting together to solve a specific problem, and then dissolving.

Galloway considers hacking as the first cultural practice to employ affected interaction with computers within the protocological network, through their good knowledge of code. Galloway argues in this book that computer languages are very similar to natural languages, having their own sophisticated syntax and grammar, but they have an element which distinguishes them from natural languages. Besides the semantic

¹⁶ Ibid., p. 142

meaning which natural languages convey, code has another executable layer, which allows the enactment of meaning. Galloway sees the close relationship of hackers to code as a consequence of the power of protocol, which forces this type of actors into a more vital, affective state within the network.

Another connection which Galloway establishes between hackers and protocol is their common mission of enabling possibility and access. The realm of possibility is the first step in hackers' utopian visions. Connecting utopia with possibility, which is the principle of protocol, turns the hacker into the agent of possibility and utopian action permitted within protocol, since protocol allows hacker action based on exploits of pre-existing bugs to gain access to code. The utopian instincts of hacking are visible in their anti-commercial actions. Hackers believe that code should be free of any proprietary interests. Hackers are *protocol natives* according to Galloway, in that they promote open source, and protocol makes its source code public and transparent in the RFCs, which are accessible to anyone.

Hackers are thus idealized in the protocological theory, as actors who help improve the protocological project, by leveraging possibility and action through the manipulation of code. Through their mission to free information by discovering holes in the system, they reinforce protocol, because the revelation of such holes is a starting point to improve the system.

The second type of disruptive practice within protocol is *tactical media*. A restricted definition of tactical media is an appropriation and use of technology by marginal groups with political purposes. Tactical media are the expression of bottom-up struggle of the networks against the power centres, which, in the control society have become distributed networks themselves. A more general definition of tactical uses of media which Galloway employs is: "those phenomena that are able to exploit flaws in protocological and proprietary command and control, not to destroy technology, but to sculpt protocol and make it better suited to people's real desires."¹⁷ Therefore Galloway approaches tactical media in terms of their effects in relation to protocol, namely showing the failures of protocol.

One phenomena that fits this definition is the *computer virus*. Galloway proposes a periodization of the connotations associated with the computer virus. The discursive formation of the self-replicating computer programs, which starts with an idealized stage, taking place in the MIT labs as an activity of technical innovation and exploration in the '60s, is continued with two negative periods of interpretation, connected with the historical moment of the disciplinary societies, where integrity and security of organic and nonorganic bodies was an important element of social control. He argues that, although they are related to positive concepts, such as viral marketing, or self replicating organisms, viruses are almost exclusively seen as hostile and harmful, and have been associated with two large threat paradigms during their existence. The AIDS paradigm dominated the late 80's, while the terrorism paradigm started in the late '90s, and placed viruses under the category of weapons of mass destruction and in the discourse of cyberterrorism.

Galloway is trying to introduce a shift in the interpretation of viruses as well, and redefines them as non-human agents or artificial life with the capacity of self-replication, which can be connected with Marx's concept of second nature, thus emphasizing their influence in the aesthetization of protocol. He also tries to put a positive spin on them by connecting them with the first idealized phase of hacking taking place at the MIT in the '60s. Seen as programs which exploit the logical flaws within a computer system, they are aimed at infecting proprietary technology, indentifying it as an anti-protocological technology. Thus the phenomena is redefined in terms of the protocological theory and

¹⁷ Ibid., p. 176

its effects are to reinforce and improve protocol. While viruses are more accidental according to Galloway, tactical media is in general more documented.

The next type of tactical media which Galloway brings into discussion to support his argument is *cyberfeminism*. Again Galloway makes a shift in the discourse about cyberfeminism to make it fit his theory of protocol. Redefined, cyberfeminism is a tactical media which reflects on the totality of protocol.

He uses the label of cyberfeminism for the theoretical current started by Sadie Plant and Sandy Stone. Plant's project to rewrite the history of computing in order to rehabilitate the role of women in it¹⁸, and her theory of the inherent feminine nature of technology, marks the beginning of the '90s' movement called cyberfeminism, which tackles the relationship surrounding identity, technology and the body. Plant's argument is that technology and cybernetics' possibility of self replication allow the obliteration of the masculine element and are a sign of the feminine nature of technology.

Sandy Stone tackles another central theme of cyberfeminism, the body¹⁹. Stone, in line with Foucault's "repressive hypothesis"²⁰, claims that new technologies, far from removing the issue of gender, proliferate the organization of gendered bodies in space. Digital spaces are conceptualized as spaces of social practice based on interacting gendered bodies. Through the action of cyberfeminism as tactical protocol, digital networks become Cartesian and body based. Protocological spaces are imagined as a prosthesis, as an extension of one's body, which allows interaction with other virtual bodies. Artistic groups such as VNS Matrix provide tactics for Stone's and Plant's theories because they center their praxis on women and technology.

While in the '80s under the influence of Donna Haraway cyberfeminism promoted the image of the hybrid woman-machine as a non-gendered identity to oppose patriarchy²¹, Galloway uses the contemporary approach to cyberfeminism, as theorized by authors of the '90s, such as Stone and Plant, which present technology as a female object. Galloway uses this theory to argue that protocol is cyberfeminist due to its politics of resistance to patriarchy visible in its anti-hierarchical structure. While with early cyberfeminism resistance to patriarchy is not to be found in reproductive body parts but in the hybrid, with new cyberfeminism Galloway suggests that resistance is to be found in protocol, because it is itself of feminine nature.

Galloway includes these range of practices under the umbrella of tactical media after having redefined them in terms of protocol, as aimed at challenging the formal qualities of protocol, by pointing out the flaws of proprietary command and control. Their politically progressive effects are meant to push the traditional use and state of media through hypertrophy in order to force it to mould according to the desires of the users.

Having shown a few types of disruptive practices within protocol, Galloway returns to the changing nature of resistance and conflict within the protocological age, visible in the *diagrammatic narrative*. He presents the expanded use of the new diagram of distributed control specific to the Internet at a societal level, as a reaction to another social diagram, the centralized one. The two conflicting diagrams, the centralized power and control, and the distributed power and control, represent the current global crisis and require policy changes towards a reorganization of the centralized power into a distributed network in order to overpass it. Consequently, according to Arquilla and Ronfeldt²², the future will be one of *netwar*, a war of networks by use of technology. Arquilla and Ronfeldt suggest the

¹⁸ Plant, Sadie, *Zeros and Ones*, Doubleday, New York, 1997, in Galloway, *Protocol*, p. 188

¹⁹ Stone, Sandy, *Will the Real Body Please Stand Up?*, in *Cyberspace: First Steps*, MIT Press, 1992, in Galloway, *Protocol*, p. 190

²⁰ Foucault, *History of Sexuality*, in Galloway, *Protocol*, p. 190

²¹ Donna Haraway, *A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century*, in *Simians, Cyborgs and Women: The Reinvention of Nature*, Routledge, New York, 1991, p. 149-181

²² Arquilla and Ronfeldt, *Networks and Netwars*, p. 6, in Galloway, *Protocol*, p. 196

reorganizing of hierarchy into network in order to fight other networks, because the network is immune to the hierarchy. Galloway tries to operate a generalization and idealization of the distributed network diagram as well, in spite of its current mainly negative use, and mentions a few positive current and future uses of the distributed diagram, as in corporate management, grassroots activist groups, and the network-centric military.

The last type of disruptive practice analyzed by Galloway is *Internet art*. He introduces Internet art as the “new art”, by the use of Derrida’s comment related to video as artistic medium: “one never sees a new art, one thinks one sees it; but a ‘new art’, as people say a little loosely, may be recognized by the fact that it is not recognized”²³ Galloway takes Derrida’s argument further and suggests that the new art is in fact not the video, but the new media art which has emerged with the arrival of digital computers. Galloway defines new media art as “any contemporary art that uses new media technology”²⁴, and covers the fields of: Internet art, CD-ROM, installation art, digital video, electronic games, etc.

Internet art in particular covers any type of artistic practice within the Internet. Galloway distinguished two periods of Internet art: the early Internet art, which emerged in 1995, as a highly conceptual phase concerned with the network in a self-referential mode and known as *net.art*, and later Internet art, which emerged in 2000, concerned with the software, which can be defined as the corporate or commercial phase. Galloway introduces Internet art as a disruptive practice because of its tactical qualities. Following Marina Gržinić, Galloway argues that the very limitations of new media technology: computer crashes, technical glitches, corrupted code allow the new form, Internet art to disengage from previous forms and mediums of art and gain its own specificity through the uniqueness of the medium.

Net art emerged in the political context of hacking and tactical media. The two movements, driven by opposite political views (libertarian view promoting freedom of information versus leftist progressive politics), first entered in conflict at Ars Electronica in 1998, when a tactical media project, the visualisation tool Floodnet, which rendered the space of protocol as a disturbance by using tools to create disturbances on the Internet, was criticized by a hacker group for limiting access to information. This incident proves the political nature of protocol and implicitly turns any artistic practice within it into politically driven art.

Internet art thus emerges in the political context of protocol as *conceptual art* and it usually operates a spatialization of the web, a sculpture like visualization of the protocol with the purpose of exposing its flaws and contesting it thus, in projects like Jodi’s 404, and others which exploit Internet errors. Internet art is self-referential because it addresses its own medium, and has tactical effects because it “plays” with protocol in order to expose errors of the system and put them to its own use. It is concerned with making protocol visible by mapping the protocol’s limitations and failures, such as bandwidth limitations, or errors in the World Wide Web protocol. Famous for the early Internet art are the Jodi projects, which focus on the moments when computers break down (crash, bug, glitch), and exploit them to expose their aesthetics. Bunting’s project of staging the inability to load an art webpage, is the radical expression of protocol’s failure, leaving the audience experience the failure directly. It was also conceived as an anticipation of the end of net.art.

Since the primary limitation of the Internet, the bandwidth, has started to disappear, artists turned towards exploiting the limitation of software in the late ‘90s. The shift from network art to software art is considered to have taken place in 2000, in the context of the Etoy war, which marked the transition from Internet art being defined by the

²³ Derrida, Jacques, *Videor*, in *Resolutions*, University of Minnesota Press, Minneapolis, 1996, p. 75, in Galloway, *Protocol*, p. 210

²⁴ Galloway, *Protocol*, p. 210-211

limitations of the network to Internet art being defined by the commercial interests of the software industry. This second stage of Internet art marks the beginning of artists' aesthetization of corporate practices of moneymaking, like in the case of Etoy or RTMark.

Galloway further focuses on one particular subgenre of Internet art, *auction art*, which mixes both art as network and art as software, showing both limitations of the software, residing in its proprietary nature, and of the network, residing in the protocological control. Auction art is art which uses online auction websites, such as eBay to make an artistic declaration, by, for example, auctioning of personal demographics by artist Jeff Gates, or auctioning of own body by artist Michael Daines, in order to make a statement about the commodification of the body. eBay art is a commercial art genre because it engages with commercial transactions on the web. The art as network side of eBay art is rendered by its aesthetization of the network relations between the eBay webpage and other places in the network, such as email lists where the artists post auction announcements, turning art into a type of social exchange.

Drawing on the critical theory approach and a material understanding of technology, Galloway's book presents a well argued counterpoint to the early utopian conceptions about internet: the founding principle of the internet is control, not freedom. Although Galloway concludes his analysis by asserting that protocol is neither good nor bad, the last part of his book implies a certain romanticism in considering the future of protocol as eventually a progressive project: "Protocol is a universalism achieved through negotiation, meaning that in the future protocol can and will be different"²⁵

²⁵ Ibid., p. 243