DEPLOYING MICROSERVICES

Belarusian State University of Informatics and Radioelectronics
Minsk, Republic of Belarus

Petrovich A.S.

Andreeva O.V. – Lecturer

Microservices are the next generation of service-oriented architecture (SOA) and they are used to create decentralized distributed software systems with low coupling and strong cohesion. The purpose of this article is to explain the main principles of MSA.

Microservices are small independent services working together to achieve common aims. It is not a new concept – its roots are tracing back for more than 10 years - but it received its popularity and wide distribution in the near past. It became possible due to the fast growth of IT-sphere which has created such giants as Google, Microsoft, Netflix, Amazon and others. And these giants have realized that monolithic systems are extremely unprofitable due to the problems of scaling these systems. So SOA architecture was built to resolve them. But nowadays, it is again not enough. And microservices architecture (MSA) is going to replace it.

Microservices do not bring a lot of new features in comparison with services, because it is not a new architecture, it is the next generation. However, the canonical representation of microservices has many advantages even in comparison with the paternal service architecture. But it can be achieved only provided that the principles of microservices architecture construction are strictly observed. (Figure1).

Microservices are a very young technology, so some other patterns to produce MSA may be good too. It should emphasize it is up to architect to build the best way to produce software complex.

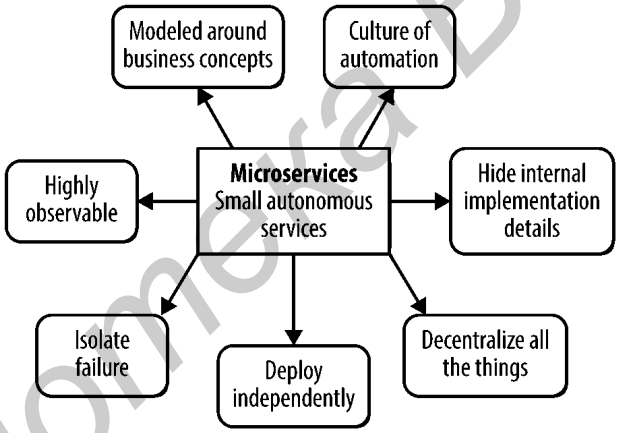

Figure1. The principles of MSA

One of the good ways to decompose microservices is modelling around business processes (Figure 2). Different departments in various real companies have a weak linkages that is why the creating services that represent these departments is very useful. Nevertheless, in the case of creating microservices from scratch (instead of monolith partitioning) it is easier to face the problem of incorrect determination of the boundaries of the service. It happens due to misunderstanding of the business processes occurring at the company which developed microservice is based on. But the size of microservices means that every error can be fixed fast.

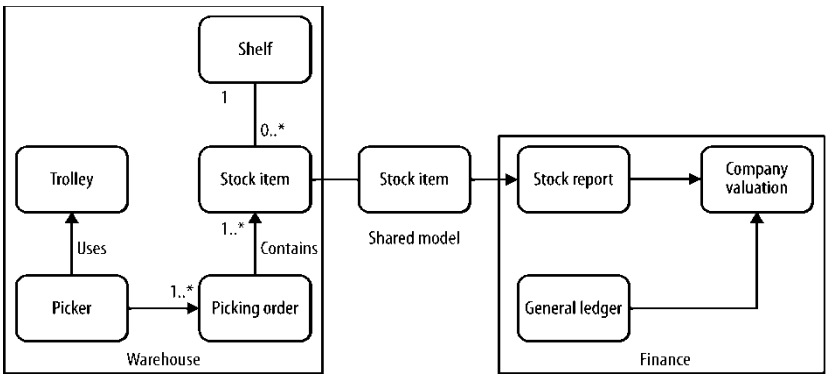

Figure2. Example of modelling around business processes

As it is shown on figure 2, warehouse and finance microservices are “boxed”. It means that details of the realization of each service must be hidden. As the best practice, microservice must be represented to others services by API as the only way of communication.

Trends of Decentralization are seen in many modern software (eg Blockchain). So microservices tend not to have a common point of failure. It means that failure in some services must not lead to the collapse of the entire system. It is necessary that MSA is not located on a single platform (golden rule: one host - one microservice) and even in a single data center to avoid loss of the entire system efficiency due to the failure of some physical servers.

Losing datacenter is not the only one issue that can be faced in the process of developing microservices. The aim of a good architect is to create a stable microservices construction. When one part of the system works badly it should not affect the other parts. It is one of the advantages of using MSA, because failure isolation is almost impossible in monolith systems.

When MSA are splitted, decentralized and isolated it can be a nice bonus to be able to deploy microservices independently of each other. This provides a lot of advantages, but also imposes the obligation to provide the old API in conjunction with the new one because the other teams could not be ready for conversion.

Microservices imply facing a lot of mistakes during development. But in contrast to monolithic systems, it is not so bad in MSA, especially when system is ready for them. As it is described above, all failures should be isolated. But for the teams developing and maintaining microservices it is very important to recognize quickly these mistakes and react to them. In order to do it it is very useful to have well configured monitoring systems.

In the modern world more and more work is done by machines instead of people. The MSA system must be automatized as well. The more services we have, the harder it is to trace them. And this complex should be able to perform basic verification work without human attention. We must create a fully automated supervisor that controls the release of new version of the service to manufacturing and monitors it in order to reduce development costs and to free up as many resources as possible.

References:

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AVERAGE POWER MICROWAVE PLASMATRON FOR SEMICONDUCTING MATERIALS REMOVAL

Belarusian State University of Informatics and Radioelectronics
Minsk, Republic of Belarus

Tikhon O.I.

Liahushevich S.I. – Candidate of Philological Sciences, Docent

The purpose of this paper is to review modern trends in semiconducting materials plasma processing, to show results of photoresist removal and describe microwave plasmatron used for such treatment.

Trends of microelectronics development are characterized by rejection of the wet-chemical etching applications during electronic components production. Dry plasma technologies are becoming universal and have virtually no alternatives. Currently big variety of devices based on microwave technology which allows for a large part of the integrated circuits fabrication processes to be realized has been developed. The microwave plasma discharge is an effective mechanism for transmitting of the electromagnetic field power in gas. Plasma processes are widely used for such purposes as etching of semiconducting, metal or dielectric layers; plasma nitridation or oxynitridation of silicon; cleaning of the wafers surfaces and many other applications [1].

Technological plasma for all above-mentioned processes is generated by plasma generators on the basis of an electric discharge in reactive gas. However, such a wide range of applications eliminates the possibility of all-purpose plasma chemical reactor creation. This factor stimulates the development of more efficient new devices able to show the results that exceed those provided by currently used plasma unit. An important task in the development of submicron structures plasma etching reactors is to provide high speed and selectivity of the processes along with the unit efficiency increase. It requires the forming of high density plasma capable of effective ion energy control. Combined dual frequency plasma discharges can be used for the functional separation of these processes. According to scientific and technical literature analysis the formation of combined plasma discharges is not fully studied which makes the investigation of electrical and technological characteristics of such discharges an urgent task.