

Studying the Impact of 32-bits AS Numbers on Constructing Internet AS Graphs

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Modeling Internet structure as an autonomous system (AS) graph is considered one of the most common methods to study the Internet. AS-graph is constructed by utilizing ASes from the Internet. The AS number was 16-bit address. It reduced the size of ASes scope in one hand and made the AS graph small and easy to be produced and modeled. However, the number of ASes has exceeded the 16-bits limits. The 32-bit addressing has emerged as a method to tackle this problem. This increasing in the AS number scope converted the AS graph into a massive graph with unpredicted number of ASes. In this paper, we attempt to study the impact of 32-bits addresses on the AS graph. Graph parameters have been utilized to measure this impact. To this end, we have constructed two AS-graphs, a 16-bits-AS graph and a full AS graph. We have compared these graphs according to cluster coefficient, betweenness centrality, node degree and average shortest path. Our results demonstrated that the 32-bits ASes are popular. Moreover, these ASes have an effect on reducing the value of the global cluster coefficient and increasing the average shortest path. We observed that the number of vertexes that connect 16-bits and 32-bits ASes is small and requires more inferring.